

US EPA ARCHIVE DOCUMENT

## **Appendix D**

### **Chemical-Specific Parameters for Source Partitioning and Fate and Transport Models**



## Appendix D

# Chemical-Specific Parameters for Source Partitioning and Fate and Transport Models

This appendix presents values and references for the chemical-specific parameters used in the source partitioning model and the fate and transport model for the human health and ecological assessments. Information is presented in a separate table for each constituent; the parameters are divided into the following groups:

- Chemical/physical properties (general)
- Degradation rates
- Temperature correction routines
- Biotransfer factors - plants
- Biotransfer factors - food chain
- Additional source modeling parameters
- Additional fate and transport modeling parameters.

In addition to the parameter values and references, the tables indicate whether a value is taken directly from the cited source or is calculated based on equations in the cited source. Some of the chemical-specific data were processed to adjust for unit consistency with the models.

The major sources for chemical-specific data include U.S. EPA references such as the Superfund Chemical Data Matrix (SCDM) (U.S. EPA, 1996b), the *Parameter Guidance Document* (U.S. EPA, 1997d), and *Methodology for Assessing Health Risks Associated with Multiple Pathways of Exposure to Combustor Emissions* (U.S. EPA, 1998). Additional sources were used as they related to a specific parameter or chemical.

For chemical/physical properties, SCDM was the preferred source because it is peer-reviewed and contains the majority of the constituents evaluated. Chemical/physical property values were obtained from other sources only if data were not available in SCDM. The additional sources of chemical/physical property data included Internet databases, such as ChemFinder.com (1999) and the SRC (1999) database maintained by the Syracuse Research Corporation. The preferred source of data for degradation rates was Howard et al. (1991). If a value was not available in Howard et al. (1991), the degradation rates were derived from Howard

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(1989). Hydrolysis rates are based on an equation provided in *EPA's Composite Model for Leachate Migration with Transformation Products. EPACMTP: User's Guide* (U.S. EPA, 1997a). The organic biotransfer factors for plants and food chain were derived from the *Methodology for Assessing Health Risks Associated with Multiple Pathways of Exposure to Combustor Emissions* (U.S. EPA, 1998). Biotransfer factors for metals were provided from several empirical sources.

Both the source partitioning model and the fate and transport model used the general chemical/physical property data and the degradation rates. The temperature correction routines were used only in the source model, and the biotransfer factors were used only in the fate and transport model.

Different degradation rate parameters were called for in the two models, as shown in the table below. The source partitioning model specifies an aerobic and an anaerobic degradation rate, whereas the fate and transport model specifies degradation rates for surface water, soil, and sediment. Degradation rate data were reported as rates for specific media (i.e., surface water, soil, and sediment). Therefore, for the source partitioning model, the data were used as shown in the following table.

### Use of Degradation Rate Data in Source Partitioning and Fate and Transport Models

Available Degradation Rate Data	Source Partitioning Model Parameter	Fate and Transport Model Parameter
Surface water degradation rates	Aerobic degradation parameter for surface impoundments and tanks	Surface water degradation rate
Soil degradation rates	Aerobic degradation parameter for landfills	Soil degradation rate
Sediment degradation rates	Anaerobic degradation rate for surface impoundments, tanks, and landfills	Sediment degradation rate

Tables D-1 through D-44 document the chemical-specific values used for each of the constituents. The values are categorized in accordance with parameter type for easy reference. In the sections that follow, alternate data sources are detailed more explicitly.

### Chemical/Physical Properties

- *Diffusivity in Air ( $D_a$ )* - Values for mercury species (elemental, divalent, and methylmercury) were taken from the Mercury Report to Congress (U.S. EPA, 1997b).

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- *Diffusivity in Water ( $D_w$ )* - Values for mercury species (elemental, divalent, and methylmercury) were taken from WATER8 (U.S. EPA, 1995) because values are not provided in the Mercury Report to Congress (U.S. EPA, 1997b). The values for divalent and methylmercury were default values equal to 8E-06 cm<sup>2</sup>/s.
- *Octanol-water partition coefficient ( $K_{ow}$ )* - For xylene, the average value for all reported isomers was used.
- *Organic-carbon-normalized partition coefficient ( $K_{oc}$ )* - Kollig (1993) was the preferred source for  $K_{oc}$  values. For those chemicals not covered in Kollig (1993),  $K_{oc}$  values were calculated in relation to  $K_{ow}$  using an equation provided in Kollig (1993).
- *Soil-water partition coefficient ( $K_d$ )* - Values for organic compounds were calculated within the models in accordance with the relationship between  $K_d$  and  $K_{oc}$ . Values for metals were based on laboratory measurements reported in the scientific literature (see Appendix H).  $K_d$  distributions were developed and used for metals for which more than nine empirical values were reported in the scientific literature. For metals for which there was a scarcity of empirical data, a log uniform distribution was developed. Because no data were available for nickel oxide, the data distribution for nickel was used as a surrogate. For mercury species, the Mercury Report to Congress (U.S. EPA 1997b) provides a distribution for divalent mercury and single values for elemental and methylmercury.

**Chemical/Physical Properties – Degradation Rates**

- *Degradation rates (water, soil, sediment) ( $k_{xx}$ )* - Recommended water, soil, and sediment degradation rates were obtained from Howard et al. (1991) for all constituents except vinyl acetate and acrylamide. Data were reported as half-lives in Howard et al. (1991) and were converted to rate constants (k) using the following equation:

$$k = \left( \frac{1}{halflife} \right) (\ln 2)$$

When data were reported as a range in Howard et al. (1991), the maximum half-life was used to calculate degradation rates.

Values for vinyl acetate and acrylamide were derived from data in Howard (1989). For vinyl acetate, the half-lives selected from Howard (1989) are based on CO<sub>2</sub> evolutions using nonacclimated sewage inocula of 27 and 49 percent over 19 and 38 days and are most comparable to the high-end half-lives used for other constituents. The average rate from this study is 0.0171 1/days, which translates

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into a half-life of 970 hours, or 40 days. This value was used for the surface water and soil degradation rates. The half-life was multiplied by 4 to derive a sediment degradation rate.

For acrylamide, half-life data were reported in Howard (1989) for surface water and for sediment. The water and soil degradation rates were derived from river die away tests in which 90 percent of acrylamide disappeared in 320 hours, or 0.1727 1/day (96 half-life hours). The sediment degradation rate was derived from a study under anaerobic conditions in which 77 percent of acrylamide degraded in 14 days, or 0.1034 1/day (161 half-life hours).

- *Hydrolysis Rate (Kh)* – Hydrolysis rates were used in the source model and the fate and transport model. Hydrolysis rate constants were obtained from Kollig (1993).

### Chemical/Physical Properties – Temperature Correction Factors

- *Boiling Point (tb)* - SCDM (U.S. EPA, 1996b), SRC (1999), and ChemFinder (1999) were the primary sources of boiling point data.
- *Critical Temperature (tc)* - The CRC Handbook (Weast, 1997) was the preferred source for critical temperature values. Reid et al. (1997) was also used to provide critical temperature. The values are provided in Celsius.
- *Antoine's B Constant (AntB)* - Although the value for Antoine's B constant is reported in Reid et al. (1997) in units of kelvin, Lyman et al. (1990) clearly state that the values for Antoine's B constant should not be converted from degrees C to degrees K. B constant represents the slope of the relationship, which is the same in Celsius and kelvin.
- *Antoine's C Constant (AntC)* - Antoine's C constant must be converted from degrees kelvin to degrees Celsius. Antoine's C constant data were obtained from Reid et al. (1997).
- *Critical Pressure (Pc)* - The CRC Handbook (Weast, 1997) was the preferred source for critical pressure values. Reid et al. (1997) was also used to provide critical pressure. Both sources provided the values in atm.

### Biotransfer Factors – Plants

- *Mass-Based Air-to-Plant Biotransfer Factor (Bv)* - Calculated for exposed fruits and vegetables, forage, and silage for organic constituents only as follows:

$$Bv = \left[ \frac{\rho_{air} \times Bvol}{\left( \frac{(100 - MAF_{planttype})}{100} \right) \times \rho_{leaf}} \right] \times \frac{1}{Bv_{ecf\_plant}} \quad (D-1)$$

where

$Bv$  = biotransfer factor ( $\mu\text{g/g DW plant}/\mu\text{g/g air}$ )

$\rho_{air}$  = density of air (constant at 1.19 g/L)

$Bvol$  = biotransfer factor ( $\mu\text{g/L } F_w \text{ leaf}/\mu\text{g/L air}$ ) (see Equation D-2)

$MAF_{(planttype)}$  = moisture content in leaf (percentage)

$\rho_{leaf}$  = density of the leaf (g/L  $F_w$ )

$Bv_{-ecf\_plant}$  = empirical correction factor for  $Bv$  (unitless).

- *Volume-Based Air-to-Plant Biotransfer Factor* - Calculated for exposed fruits and vegetables, forage, and silage for organic constituents only. This parameter is calculated as follows:

$$\log Bvol = 1.065 \log K_{ow} - \log \left( \frac{HLC}{RT} \right) - 1.654 \quad (D-2)$$

$$Bvol = \text{antilog} [\log Bvol]$$

where

$Bvol$  = biotransfer factor ( $\mu\text{g/L } F_w \text{ leaf}/\mu\text{g/L air}$ )

$K_{ow}$  = octanol/water partition coefficient (unitless)

$HLC$  = Henry's law constant ( $\text{atm}\cdot\text{m}^3/\text{mol}$ )

$R$  = universal gas constant (constant at 8.205E-05  $\text{atm}\cdot\text{m}^3/\text{mol}\cdot\text{K}$ )

$T$  = air temperature (constant at 298.1 K).

As stated, air-to-plant biotransfer factors are calculated only for organic constituents. Biotransfer factors for metals are derived from empirical sources.

- *Root Concentration Factor (RCF)* - Calculated for root vegetables for organic and special constituents characterized by  $\log K_{ow}$  values less than or equal to 2.0:

$$\log(RCF - 0.82) = 0.77 \log K_{ow} - 1.52 \quad (D-3)$$

$$RCF = \text{antilog}(\log RCF)$$

where

$RCF$  = root concentration factor ( $[\mu\text{g/g WW plant}]/[\mu\text{g/mL soil water}]$ )  
 $K_{ow}$  = octanol/water partition coefficient (unitless).

Calculated for root vegetables for organic and special constituents characterized by  $\log K_{ow}$  values greater than 2.0:

$$\log RCF = 0.77 \log K_{ow} - 1.52 \quad (D-4)$$

$$RCF = \text{antilog}(\log RCF)$$

where

$RCF$  = root concentration factor ( $[\mu\text{g/g WW plant}]/[\mu\text{g/mL soil water}]$ )  
 $K_{ow}$  = octanol/water partition coefficient (unitless).

- *Biotransfer Factor for Soil to Plant (Br)* - Calculated for exposed and protected fruits and vegetables, forage, silage, and grain for organic constituents only:

$$\log Br = 1.588 - 0.578 \log K_{ow} \quad (D-5)$$

$$Br = \text{antilog} [\log Br]$$

where

$Br$  = biotransfer factor ( $[\mu\text{g/g DW plant}]/[(\mu\text{g/g soil})]$ )  
 $K_{ow}$  = octanol/water partition coefficient (unitless).

### Biotransfer Factors – Food Chain

- *Beef Biotransfer Factor (Ba<sub>beef</sub>)* - Soil bioavailability is the ratio between biotransfer factors for soil and vegetation for a given contaminant. The efficiency of transfer from soil may differ from the efficiency of transfer from plant material for some chemicals. Vegetation is a more efficient vehicle of transfer for organic and inorganic contaminants than is soil, since vegetation is digested and soil passes through the system. A beef biotransfer factor was calculated based on the chemical type. If the chemical is organic and has a  $\log K_{ow}$  value between 1.3 and 6.9, the beef biotransfer factor is calculated as shown in Equation D-6. This

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equation is only valid for chemicals with a log  $K_{ow}$  between 1.3 and 6.9. For organic chemicals that have a log  $K_{ow}$  less than 1.3 or greater than 6.9, only empirical biotransfer factors are used. In the absence of empirical data for such chemicals, the beef biotransfer factors are set to 0.

$$\begin{aligned}\log Ba_{beef} &= -7.6 + \log K_{ow} \\ Ba_{beef} &= \text{antilog } [\log Ba_{beef}]\end{aligned}\quad (\text{D-6})$$

where

$$\begin{aligned}Ba_{beef} &= \text{beef biotransfer factor (d/g tissue whole weight)} \\ K_{ow} &= \text{octanol/water partition coefficient (unitless).}\end{aligned}$$

- *Milk Biotransfer Factor ( $Ba_{milk}$ )* - Milk concentrations are calculated in the same way as beef concentrations except the quantity numbers are for dairy cattle not beef cattle. The milk biotransfer factor is calculated as shown in Equation D-7. If the chemical is organic and has a log  $K_{ow}$  value between a minimum of 2.8 and maximum of 6.9, the milk biotransfer factor is calculated.

$$\begin{aligned}\log Ba_{milk} &= -8.1 + \log K_{ow} \\ Ba_{milk} &= \text{antilog } [\log Ba_{milk}]\end{aligned}\quad (\text{D-7})$$

where

$$\begin{aligned}Ba_{milk} &= \text{milk biotransfer factor (d/g tissue whole weight)} \\ K_{ow} &= \text{octanol/water partition coefficient (unitless).}\end{aligned}$$

If the chemical is organic or special and has a log  $K_{ow}$  less than 2.8 or greater than 6.9, an empirical milk biotransfer factor is used. If no empirical data exist then  $Ba_{Milk}$  is set to zero.

- Bioconcentration factor for fish (BCF) - BCFs are separated by trophic level. Level 3 fish are smaller and eat mainly zooplankton and phytoplankton, while Level 4 fish are larger and mainly eat other fish. The BCF is calculated as shown in Equation D-8:

$$BCF_{TrophicLevel} = 10^{(a_{mus} \times \log K_{ow} + b_{mus} \times \log LipFrac_{TrophicLevel} + c_{mus})} + WaterFrac_{mus} \quad (\text{D-8})$$

where

$BCF_{TrophicLevel}$	= BCF for fish for each trophic level (L/kg tissue)
$WaterFrac_{mus}$	= fraction of whole-body fish that is water (wet weight) (0.79)
$a_{mus}$	= primary slope term (0.69)
$b_{mus}$	= secondary slope term (0.92)
$c_{mus}$	= empirical error term (0.76)
$LipFrac_{TrophicLevel}$	= lipid fraction for each trophic level (kg lipid / kg tissue) (Trophic Level 3 = 0.0182; Trophic Level 4 = 0.031)
$K_{ow}$	= octanol-water partition coefficient (assume L/kg lipid).

### **Additional Source Modeling Parameters**

- *FracNeutral* - All nonionizing chemicals were assigned a value of 1. All ionizable organic compounds were evaluated in terms of the potential to ionize under the pH conditions of this risk assessment. Phenol and 2,4-dimethylphenol ionize only under extreme pH conditions. Since the pH range considered in this assessment is from 4 to 10, phenol and 2,4-dimethylphenol were categorized as nonionizing chemicals and assigned a value of 1.

Pentachlorophenol (PCP) is the only ionizing organic compound in this assessment; the FracNeutral value for PCP was generated using a Monte Carlo procedure. Specifically, for the source model, pH was randomly varied between 4 and 10 in order to develop the distribution of FracNeutral for PCP. In the fate and transport model, FracNeutral was based on the pH of the soil. FracNeutral was calculated as described in U.S. EPA (1996a).

### **Additional Fate and Transport Modeling Parameters**

- *Fraction of wet deposition adhering to plant surface ( $F_w$ )* - A default value of 0.6 was assumed for all constituents (U.S. EPA, 1997c).
- *Dry deposition velocity (Vdv)* - A default value of 0.2 was assumed for all constituents (Koester and Hites, 1992).

**Table D-1. Chemical-Specific Inputs for Acrylamide (79-06-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	71.08	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.007	U.S. EPA, 1997c
S	Water solubility (mg/L)	640000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.00E-09	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	9.70E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.06E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.10E-01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.03E-01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	1.73E-01	Howard, 1989
K <sub>sg</sub>	Degradation rate in soil (1/yr)	1.73E-01	Howard, 1989
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.03E-01	Howard, 1989
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	1.43E-05	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	2.78E-05	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	192.6	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	ID	
AntC	Antoine's C constant (degrees C)	ID	
Pc	Critical pressure (atm)	ID	
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-1. Chemical-Specific Inputs for Acrylamide (79-06-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	8.26E-01	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.39E+02	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.39E+02	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.39E+02	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.39E+02	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.39E+02	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.39E+02	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	8.21E-01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	8.41E-01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-2. Chemical-Specific Inputs for Acrylonitrile (107-13-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	53.06	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	109	U.S. EPA, 1997c
S	Water solubility (mg/L)	74000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.03E-04	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.22E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.34E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.78E+00	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	8.15E-01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	3.01E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	3.01E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	7.53E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	3.24E-07	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	8.80E-07	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	77.3	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	262.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2782.21	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-324.3	Reid et al., 1977
Pc	Critical pressure (atm)	45	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-2. Chemical-Specific Inputs for Acrylonitrile (107-13-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	3.11E-01	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.78E+01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.78E+01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.78E+01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.78E+01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.78E+01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.78E+01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.00E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.14E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-3. Chemical-Specific Inputs for Antimony (7440-36-0)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	121.75	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFS</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-3. Chemical-Specific Inputs for Antimony (7440-36-0)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.00E-01	Baes et al., 1984
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.00E-01	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.00E-01	Baes et al., 1984
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.00E-01	Baes et al., 1984
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.00E-03	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.00E-04	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-4. Chemical-Specific Inputs for Barium (7440-39-3)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	137.33	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFS</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-4. Chemical-Specific Inputs for Barium (7440-39-3)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.50E-01	Baes et al., 1984
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.50E-01	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.50E-02	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.50E-01	Baes et al., 1984
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.50E-02	Baes et al., 1984
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.50E-01	Baes et al., 1984
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	1.50E-02	Baes et al., 1984
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.50E-04	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	3.50E-04	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-5. Chemical-Specific Inputs for Benzene (71-43-2)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	78.11	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	95	U.S. EPA, 1997c
S	Water solubility (mg/L)	1750	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	5.55E-03	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	8.80E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	9.80E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.35E+02	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	6.31E+01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	4.33E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	4.33E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	9.63E-04	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	80	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	288.95	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2788.51	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-325.51	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	48.3	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-5. Chemical-Specific Inputs for Benzene (71-43-2)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.32E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.27E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.27E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.27E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.27E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.27E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.27E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	3.39E-06	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	5.05E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	7.74E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-6. Chemical-Specific Inputs for Butyl alcohol, n- (71-36-3)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	74.12	CHEMFATE, 1999
VP	Vapor pressure (Torr)	6.7	CHEMFATE, 1999
S	Water solubility (mg/L)	74000	CHEMFATE, 1999
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	8.81E-06	CHEMFATE, 1999
Da	Diffusivity in air (cm <sup>2</sup> /s)	8.00E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	9.30E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	7.59E+00	CHEMFATE, 1999
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	3.18E+00	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.28E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	117.73	CHEMFATE, 1999
tc	Critical temperature (degrees C)	289.8	Weast, 1979
AntB	Antoine's B constant (degrees C)	3137.02	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-367.58	Reid et al., 1977
Pc	Critical pressure (atm)	43.6	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-6. Chemical-Specific Inputs for Butyl alcohol, n- (71-36-3)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	9.50E-01	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.20E+01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.20E+01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.20E+01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.20E+01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.20E+01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.20E+01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.37E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.74E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-7. Chemical-Specific Inputs for Butylbenzylphthalate (85-68-7)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	312.37	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.00000825	U.S. EPA, 1997c
S	Water solubility (mg/L)	2.69	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.26E-06	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.72E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	4.89E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	6.92E+04	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.70E+04	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	3.85E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	1.30E-07	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	1.85E-05	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	370	ChemFinder.com, 1999
tc	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	ID	
AntC	Antoine's C constant (degrees C)	ID	
Pc	Critical pressure (atm)	ID	
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-7. Chemical-Specific Inputs for Butylbenzylphthalate (85-68-7)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.61E+02	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	6.17E-02	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	6.17E-02	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	6.17E-02	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	6.17E-02	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	6.17E-02	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	6.17E-02	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.74E-03	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	5.50E-04	Calculated based on U.S. EPA, 1998
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.40E+03	HWIR, 1995
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.40E+03	HWIR, 1995
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-8. Chemical-Specific Inputs for Cadmium (7440-43-9)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	112.41	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-8. Chemical-Specific Inputs for Cadmium (7440-43-9)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	6.00E-01	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	5.50E-01	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.50E-01	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	3.10E-01	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	5.50E-02	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.10E-01	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	4.00E-01	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	5.50E-04	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.00E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	265	Barrows et al., 1980
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	265	Barrows et al., 1980
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-9. Chemical-Specific Inputs for Chloroform (67-66-3)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	119.38	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	197	U.S. EPA, 1997c
S	Water solubility (mg/L)	7920	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	3.67E-03	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.04E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.00E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	8.32E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	3.80E+01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	3.85E-03	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	3.85E-03	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	2.04E-07	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	5.78E-07	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	61.1	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	263.25	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2696.79	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-319.31	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	54	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-9. Chemical-Specific Inputs for Chloroform (67-66-3)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	6.00E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	3.01E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	3.01E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	3.01E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	3.01E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	3.01E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	3.01E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.09E-06	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	3.84E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	5.77E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-10. Chemical-Specific Inputs for Chromium (III) (16065-83-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	51.996	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	2.00E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.41E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	2642	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-10. Chemical-Specific Inputs for Chromium (III) (16065-83-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.70E-04	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	7.50E-03	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	4.50E-03	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.90E-03	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	8.50E-05	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	9.30E-03	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	6.60E-04	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	5.50E-03	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.50E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	87	U.S. EPA, 1999c
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	87	U.S. EPA, 1999c
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-11. Chemical-Specific Inputs for Chromium (VI) (18540-29-9)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	51.996	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	2.00E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.41E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-11. Chemical-Specific Inputs for Chromium (VI) (18540-29-9)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.70E-04	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	7.50E-03	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	4.50E-03	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.90E-03	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	8.50E-05	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	9.30E-03	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	6.60E-04	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	5.50E-03	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.50E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	87	U.S. EPA, 1999c
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	87	U.S. EPA, 1999c
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-12. Chemical-Specific Inputs for Cobalt (7440-48-4)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	58.9	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-12. Chemical-Specific Inputs for Cobalt (7440-48-4)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.00E-02	Baes et al., 1984
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.00E-02	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	7.00E-03	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.00E-02	Baes et al., 1984
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.00E-03	Baes et al., 1984
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.00E-02	Baes et al., 1984
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	7.00E-03	Baes et al., 1984
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.00E-02	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	2.00E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-13. Chemical-Specific Inputs for Copper (7440-50-8)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	63.546	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-13. Chemical-Specific Inputs for Copper (7440-50-8)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	7.80E-02	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	4.00E-01	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.50E-01	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.30E-01	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	5.90E-02	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	3.20E-01	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	1.50E-01	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.00E-02	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.50E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	0	Stephan, 1993
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	0	Stephan, 1993
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-14. Chemical-Specific Inputs for Cresol, m- (108-39-4)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	108.14	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.138	U.S. EPA, 1997c
S	Water solubility (mg/L)	22700	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	8.65E-07	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.40E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.00E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	9.33E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	5.75E+01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	2.39E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	2.39E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.41E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	202.2	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	432.65	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	4274.42	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-347.24	Reid et al., 1977
Pc	Critical pressure (atm)	45	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-14. Chemical-Specific Inputs for Cresol, m- (108-39-4)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.81E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.81E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.81E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.81E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.81E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.81E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.81E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.34E-06	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	4.09E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	6.18E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-15. Chemical-Specific Inputs for Cresol, o- (95-48-7)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	108.14	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.299	U.S. EPA, 1997c
S	Water solubility (mg/L)	26000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.20E-06	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.40E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.30E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	9.77E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	5.75E+01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	191	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	424.45	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	3305.37	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-381.15	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	49.4	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-15. Chemical-Specific Inputs for Cresol, o- (95-48-7)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.85E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.74E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.74E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.74E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.74E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.74E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.74E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.45E-06	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	4.20E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	6.35E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-16. Chemical-Specific Inputs for Cresol, p- (106-44-5)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	108.14	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.11	U.S. EPA, 1997c
S	Water solubility (mg/L)	21500	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	7.92E-07	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.40E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.00E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	8.91E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	5.75E+01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	1.04E+00	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	1.04E+00	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	201.9	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	431.45	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	3479.39	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-384.45	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	50.8	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-16. Chemical-Specific Inputs for Cresol, p- (106-44-5)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.78E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.89E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.89E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.89E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.89E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.89E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.89E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.24E-06	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	3.99E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	6.01E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-17. Chemical-Specific Inputs for Di(2-ethylhexylphthalate) (117-81-7)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	390.56	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.00000645	U.S. EPA, 1997c
S	Water solubility (mg/L)	0.34	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.02E-07	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	3.51E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	3.66E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	2.00E+07	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.35E+07	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	3.02E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	3.02E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.80E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	1.96E-12	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	2.16E-07	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	384	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	ID	
AntC	Antoine's C constant (degrees C)	ID	
P <sub>c</sub>	Critical pressure (atm)	ID	
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	6.11E+07	Calculated based on U.S. EPA, 1998
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	3.26E+07	Calculated based on U.S. EPA, 1998
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	6.11E+07	Calculated based on U.S. EPA, 1998
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	6.11E+07	Calculated based on U.S. EPA, 1998
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-17. Chemical-Specific Inputs for Di(2-ethylhexylphthalate) (117-81-7)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.26E+04	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.34E-03	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.34E-03	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.34E-03	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.34E-03	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.34E-03	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.34E-03	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-18. Chemical-Specific Inputs for Dibutylphthalate (84-74-2)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	278.35	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.000073	U.S. EPA, 1997c
S	Water solubility (mg/L)	11.2	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	9.38E-10	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	4.38E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	7.86E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	4.07E+04	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	2.34E+04	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	4.95E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	3.01E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	3.01E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	9.50E-08	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	1.85E-05	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	340	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	4852.47	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-411.25	Reid et al., 1977
Pc	Critical pressure (atm)	ID	
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-18. Chemical-Specific Inputs for Dibutylphthalate (84-74-2)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.07E+02	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	8.38E-02	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	8.38E-02	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	8.38E-02	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	8.38E-02	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	8.38E-02	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	8.38E-02	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.02E-03	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	3.24E-04	Calculated based on U.S. EPA, 1998
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.50E+03	HWIR, 1995
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1500	HWIR, 1995
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-19. Chemical-Specific Inputs for Dichloromethane (75-09-2)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	84.93	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	433	U.S. EPA, 1997c
S	Water solubility (mg/L)	13000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	2.19E-03	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.01E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.17E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.78E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	8.51E+00	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	2.48E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	2.48E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	6.20E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	7.94E-07	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	1.54E-06	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	40	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	237	Weast, 1979
AntB	Antoine's B constant (degrees C)	2622.44	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-314.85	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	60	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-19. Chemical-Specific Inputs for Dichloromethane (75-09-2)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.83E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	7.34E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	7.34E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	7.34E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	7.34E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.34E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	7.34E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.84E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	2.51E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-20. Chemical-Specific Inputs for Dimethylphenol, 2,4- (105-67-9)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	122.17	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.098	U.S. EPA, 1997c
S	Water solubility (mg/L)	7870	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	2.00E-06	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	5.84E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.69E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	2.29E+02	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.95E+02	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	210.9	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	3655.26	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-376.95	Reid et al., 1977
Pc	Critical pressure (atm)	ID	
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-20. Chemical-Specific Inputs for Dimethylphenol, 2,4- (105-67-9)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.98E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.67E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.67E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.67E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.67E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.67E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.67E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	5.75E-06	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	6.92E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.08E+01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-21. Chemical-Specific Inputs for Divalent mercury (7439-97-6(d))**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	201	U.S. EPA, 1997b
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	74074	Budavari, 1996
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	7.10E-10	U.S. EPA, 1997b
Da	Diffusivity in air (cm <sup>2</sup> /s)	5.54E-02	U.S. EPA, 1997b
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.00E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	302	Budavari, 1996
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	1.97E+04	U.S. EPA, 1997d
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	1.97E+04	U.S. EPA, 1997d
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	1.80E+04	U.S. EPA, 1997d
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	1.80E+04	U.S. EPA, 1997d
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	40.41	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-21. Chemical-Specific Inputs for Divalent mercury (7439-97-6(d))**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.00E-01	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.80E-02	U.S. EPA, 1997d
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.40E-02	U.S. EPA, 1997d
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.50E-01	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	8.90E-02	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	7.80E-01	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	3.50E-02	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.60E-03	U.S. EPA, 1997b
Ba_Milk	Milk biotransfer factor (day/kg)	7.70E-03	U.S. EPA, 1997b
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1600000	U.S. EPA, 1997b
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	6800000	U.S. EPA, 1997b
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

The BCF for fish is based on the methylmercury value.

**Table D-22. Chemical-Specific Inputs for Ethylbenzene (100-41-4)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	106.17	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	9.6	U.S. EPA, 1997c
S	Water solubility (mg/L)	169	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	7.88E-03	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.50E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	7.80E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.38E+03	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.00E+03	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	6.93E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	6.93E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	3.00E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	136.1	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	343.9	Weast, 1979
AntB	Antoine's B constant (degrees C)	3279.47	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-333.1	Reid et al., 1977
Pc	Critical pressure (atm)	36.9	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-22. Chemical-Specific Inputs for Ethylbenzene (100-41-4)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	7.90E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.93E-01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	5.93E-01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	5.93E-01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	5.93E-01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	5.93E-01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	5.93E-01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	3.47E-05	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	1.10E-05	Calculated based on U.S. EPA, 1998
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	2.20E+01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	3.54E+01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-23. Chemical-Specific Inputs for Ethylene glycol (107-21-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	62.07	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.092	U.S. EPA, 1997c
S	Water solubility (mg/L)	1000000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	6.00E-08	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.08E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.22E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	4.37E-02	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	3.02E-02	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	5.78E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	5.78E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.44E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	197.3	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	371.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	6022.18	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-301.4	Reid et al., 1977
Pc	Critical pressure (atm)	76	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-23. Chemical-Specific Inputs for Ethylene glycol (107-21-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.79E-02	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.37E+02	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.37E+02	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.37E+02	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.37E+02	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.37E+02	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.37E+02	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	8.07E-01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	8.17E-01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-24. Chemical-Specific Inputs for Formaldehyde (50-00-0)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	30.03	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	5240	U.S. EPA, 1997c
S	Water solubility (mg/L)	550000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	3.36E-07	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.78E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.98E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	8.91E-01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	4.27E-01	Calculated based on Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	-19.1	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	134.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2204.13	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-303.3	Reid et al., 1977
Pc	Critical pressure (atm)	65	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-24. Chemical-Specific Inputs for Formaldehyde (50-00-0)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.83E-01	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	4.14E+01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	4.14E+01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	4.14E+01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	4.14E+01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	4.14E+01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	4.14E+01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	9.23E-01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.01E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-25. Chemical-Specific Inputs for Lead (7439-92-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	207.2	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-25. Chemical-Specific Inputs for Lead (7439-92-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	3.80E-02	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	4.50E-02	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	9.00E-03	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	8.30E-02	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.40E-03	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	6.70E-02	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	3.00E-02	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	3.00E-04	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	2.50E-04	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	4.60E+01	Stephan, 1993
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	46	Stephan, 1993
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-26. Chemical-Specific Inputs for Mercury (7439-97-6(e))**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	201	U.S. EPA, 1997b
VP	Vapor pressure (Torr)	0.00196	U.S. EPA, 1997c
S	Water solubility (mg/L)	0.0562	Budavari, 1989
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	7.10E-03	U.S. EPA, 1997b
Da	Diffusivity in air (cm <sup>2</sup> /s)	5.54E-02	U.S. EPA, 1997b
Dw	Diffusivity in water (cm <sup>2</sup> /s)	6.30E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	1000	U.S. EPA, 1997b
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
K <sub>sg</sub>	Degradation rate in soil (1/yr)	NA	
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	NA	
K <sub>h<sub>LFs</sub></sub>	Hydrolysis rate in landfills (1/yr)	NA	
K <sub>h<sub>tanks</sub></sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
t <sub>b</sub>	Boiling point (degrees C)	NA	
t <sub>c</sub>	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
P <sub>c</sub>	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
B <sub>v<sub>Exveg</sub></sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	1.97E+04	U.S. EPA, 1997d
B <sub>v<sub>Exfruit</sub></sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	1.97E+04	U.S. EPA, 1997d
B <sub>v<sub>Forage</sub></sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	1.80E+04	U.S. EPA, 1997d
B <sub>v<sub>Silage</sub></sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	1.80E+04	U.S. EPA, 1997d
K <sub>p<sub>Par</sub></sub>	Plant surface loss coefficient - particulates (1/yr)	40.41	U.S. EPA, 1997d
K <sub>p<sub>Vap</sub></sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-26. Chemical-Specific Inputs for Mercury (7439-97-6(e))**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.00E-01	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.80E-02	U.S. EPA, 1997d
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.40E-02	U.S. EPA, 1997d
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.50E-01	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	8.90E-02	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	7.80E-01	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	3.50E-02	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.60E-03	U.S. EPA, 1997b
Ba_Milk	Milk biotransfer factor (day/kg)	7.70E-03	U.S. EPA, 1997b
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-27. Chemical-Specific Inputs for Methanol (67-56-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	32.04	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	126	U.S. EPA, 1997c
S	Water solubility (mg/L)	1000000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	4.55E-06	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	1.50E-01	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	1.64E-05	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.95E-01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	8.32E-02	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.39E-01	Howard et al., 1991
K <sub>h<sub>LFs</sub></sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h<sub>tanks</sub></sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	64.6	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	240	Weast, 1979
AntB	Antoine's B constant (degrees C)	3626.55	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-307.44	Reid et al., 1977
Pc	Critical pressure (atm)	78.5	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v<sub>Exveg</sub></sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v<sub>Exfruit</sub></sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v<sub>Forage</sub></sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v<sub>Silage</sub></sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p<sub>Par</sub></sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p<sub>Vap</sub></sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-27. Chemical-Specific Inputs for Methanol (67-56-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	5.67E-02	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	9.96E+01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	9.96E+01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	9.96E+01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	9.96E+01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	9.96E+01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	9.96E+01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	8.37E-01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	8.66E-01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-28. Chemical-Specific Inputs for Methyl ethyl ketone (78-93-3)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	72.11	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	95.3	U.S. EPA, 1997c
S	Water solubility (mg/L)	223000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	5.59E-05	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	8.08E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	9.80E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.91E+00	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	9.33E-01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	79.5	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	262.45	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	3150.42	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-309.8	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	41	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-28. Chemical-Specific Inputs for Methyl ethyl ketone (78-93-3)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	3.28E-01	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.67E+01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.67E+01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.67E+01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.67E+01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.67E+01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.67E+01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.02E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.16E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-29. Chemical-Specific Inputs for Methyl isobutyl ketone (108-10-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	100.16	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	19.9	U.S. EPA, 1997c
S	Water solubility (mg/L)	19000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.38E-04	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.50E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	7.80E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.55E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	7.41E+00	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	9.90E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	9.90E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	116.5	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	297.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2893.66	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-343.9	Reid et al., 1977
Pc	Critical pressure (atm)	32.3	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-29. Chemical-Specific Inputs for Methyl isobutyl ketone (108-10-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	1.65E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	7.95E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	7.95E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	7.95E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	7.95E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.95E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	7.95E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.75E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	2.35E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-30. Chemical-Specific Inputs for Methyl methacrylate (80-62-6)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	100.12	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	38.4	U.S. EPA, 1997c
S	Water solubility (mg/L)	15000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	3.37E-04	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.70E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.60E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	2.40E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	5.50E+00	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	2.48E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	2.48E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	6.20E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	9.38E-05	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	2.93E-04	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	100.5	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	278.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2974.94	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-331.3	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	37	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-30. Chemical-Specific Inputs for Methyl methacrylate (80-62-6)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	2.30E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	6.17E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	6.17E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	6.17E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	6.17E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	6.17E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	6.17E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	6.03E-07	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	2.08E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	2.90E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-31. Chemical-Specific Inputs for Nickel (7440-02-0)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	58.69	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-31. Chemical-Specific Inputs for Nickel (7440-02-0)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.10E-02	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	6.00E-02	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	6.00E-02	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	4.30E-02	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.00E-02	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.70E-01	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	2.70E-02	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	6.00E-03	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.00E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	0.8	Stephan, 1993
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	0.8	Stephan, 1993
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-32. Chemical-Specific Inputs for Nickel oxide (1313-99-1)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	74.69	ChemFinder.com, 1999
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFS</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-32. Chemical-Specific Inputs for Nickel oxide (1313-99-1)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.10E-02	See Nickel
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	6.00E-02	See Nickel
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	6.00E-02	See Nickel
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	4.30E-02	See Nickel
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.00E-02	See Nickel
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.70E-01	See Nickel
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	2.70E-02	See Nickel
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	6.00E-03	See Nickel
Ba_Milk	Milk biotransfer factor (day/kg)	1.00E-03	See Nickel
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	0.8	See Nickel
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	0.8	See Nickel
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

The Kd value is for nickel, because there are no Kd values available for nickel oxide.

**Table D-33. Chemical-Specific Inputs for Pentachlorophenol (87-86-5)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	266.34	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.0000317	U.S. EPA, 1997c
S	Water solubility (mg/L)	1950	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	2.44E-08	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	5.60E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	6.10E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.23E+05	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	Calculated based on <sub>nH</sub>	U.S. EPA, 1996
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	1.51E-01	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	3.89E-03	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	4.56E-04	Howard et al., 1991
K <sub>h<sub>LFs</sub></sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997
K <sub>h<sub>tanks</sub></sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	309.5	Budavari, 1996
tc	Critical temperature (degrees C)	ID	
AntB	Antoine's B constant (degrees C)	ID	
AntC	Antoine's C constant (degrees C)	ID	
Pc	Critical pressure (atm)	ID	
<b>Biotransfer Factors - Plants</b>			
B <sub>v<sub>Exveg</sub></sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	1.13E+06	Calculated based on U.S. EPA, 1998
B <sub>v<sub>Exfruit</sub></sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	6.04E+05	Calculated based on U.S. EPA, 1998
B <sub>v<sub>Forage</sub></sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	1.13E+06	Calculated based on U.S. EPA, 1998
B <sub>v<sub>Silage</sub></sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	1.13E+06	Calculated based on U.S. EPA, 1998
K <sub>p<sub>Par</sub></sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p<sub>Vap</sub></sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-33. Chemical-Specific Inputs for Pentachlorophenol (87-86-5)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	2.51E+02	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	4.43E-02	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	4.43E-02	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	4.43E-02	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	4.43E-02	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	4.43E-02	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	4.43E-02	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	3.09E-03	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	9.77E-04	Calculated based on U.S. EPA, 1998
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	Calculated based on pH	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

The Koc was based on a pH dependant distribution.

**Table D-34. Chemical-Specific Inputs for Phenol (108-95-2)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	94.11	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	0.276	U.S. EPA, 1997c
S	Water solubility (mg/L)	82800	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	3.97E-07	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	8.20E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	9.10E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	3.02E+01	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.70E+01	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	2.94E-01	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	6.93E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	2.48E-02	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	181.8	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	421.1	Weast, 1979
AntB	Antoine's B constant (degrees C)	3490.89	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-371.74	Reid et al., 1977
Pc	Critical pressure (atm)	60.5	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-34. Chemical-Specific Inputs for Phenol (108-95-2)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	2.75E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.40E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	5.40E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	5.40E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	5.40E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	5.40E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	5.40E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	7.59E-07	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	2.31E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	3.26E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-35. Chemical-Specific Inputs for Selenium (7782-49-2)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	78.96	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-35. Chemical-Specific Inputs for Selenium (7782-49-2)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	2.50E-02	Baes et al., 1984
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.50E-02	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	4.00E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	4.85E+02	Lemly, 1985
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1690	Lemly, 1985
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-36. Chemical-Specific Inputs for Silver (7440-22-4)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	107.8682	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-36. Chemical-Specific Inputs for Silver (7440-22-4)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	4.00E-01	Baes et al., 1984
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	4.00E-01	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.00E-01	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	4.00E-01	Baes et al., 1984
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.00E-01	Baes et al., 1984
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	4.00E-01	Baes et al., 1984
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	1.00E-01	Baes et al., 1984
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	3.00E-03	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	2.00E-02	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	0	Stephan, 1993
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	0	Stephan, 1993
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-37. Chemical-Specific Inputs for Styrene (100-42-5)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	104.15	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	6.12	U.S. EPA, 1997c
S	Water solubility (mg/L)	310	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	2.75E-03	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.10E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.00E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	8.71E+02	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	6.92E+02	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	2.48E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	2.48E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	6.20E-03	Howard et al., 1991
K <sub>h<sub>LFs</sub></sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h<sub>tanks</sub></sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	145	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	374.4	Weast, 1979
AntB	Antoine's B constant (degrees C)	3328.57	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-336.87	Reid et al., 1977
Pc	Critical pressure (atm)	39.4	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v<sub>Exveg</sub></sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v<sub>Exfruit</sub></sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v<sub>Forage</sub></sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v<sub>Silage</sub></sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p<sub>Par</sub></sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p<sub>Vap</sub></sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-37. Chemical-Specific Inputs for Styrene (100-42-5)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	5.54E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	7.74E-01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	7.74E-01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	7.74E-01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	7.74E-01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	7.74E-01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	7.74E-01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	2.19E-05	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	6.92E-06	Calculated based on U.S. EPA, 1998
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.62E+01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	2.59E+01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-38. Chemical-Specific Inputs for Tetrachloroethylene (127-18-4)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	165.83	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	18.6	U.S. EPA, 1997c
S	Water solubility (mg/L)	200	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	1.84E-02	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.20E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.20E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	4.68E+02	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.62E+02	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	1.90E-03	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	1.90E-03	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	4.00E-04	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
tb	Boiling point (degrees C)	121.3	U.S. EPA, 1997c
tc	Critical temperature (degrees C)	346.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	3259.29	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-325.3	Reid et al., 1977
Pc	Critical pressure (atm)	44	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-38. Chemical-Specific Inputs for Tetrachloroethylene (127-18-4)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	3.43E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.11E+00	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.11E+00	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.11E+00	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.11E+00	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.11E+00	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.11E+00	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.17E-05	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.08E+01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.72E+01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-39. Chemical-Specific Inputs for Tin (7440-31-5)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	118.69	ChemFinder.com, 1999
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-39. Chemical-Specific Inputs for Tin (7440-31-5)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	6.00E-03	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	6.00E-03	Baes et al., 1984
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	3.00E-02	Baes et al., 1984
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	6.00E-03	Baes et al., 1984
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	8.00E-02	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.00E-03	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1	ID; Default value
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1	ID; Default value
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-40. Chemical-Specific Inputs for Toluene (108-88-3)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	92.14	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	28.4	U.S. EPA, 1997c
S	Water solubility (mg/L)	526	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	6.64E-03	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	8.70E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	8.60E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	5.62E+02	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	2.69E+02	Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	3.15E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	3.15E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	3.30E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997.
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	110.6	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	320.8	Weast, 1979
AntB	Antoine's B constant (degrees C)	3096.52	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-326.82	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	41.6	Weast, 1979
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-40. Chemical-Specific Inputs for Toluene (108-88-3)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	3.96E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	9.97E-01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	9.97E-01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	9.97E-01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	9.97E-01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	9.97E-01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	9.97E-01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.41E-05	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.22E+01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.94E+01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-41. Chemical-Specific Inputs for Vinyl acetate (108-05-4)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	86.09	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	90.2	U.S. EPA, 1997c
S	Water solubility (mg/L)	20000	U.S. EPA, 1997c
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	5.11E-04	U.S. EPA, 1997c
Da	Diffusivity in air (cm <sup>2</sup> /s)	8.50E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	9.20E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	5.37E+00	U.S. EPA, 1997c
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	2.57E+00	Calculated based on Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	1.72E-02	Howard, 1989
K <sub>sg</sub>	Degradation rate in soil (1/yr)	1.72E-02	Howard, 1989
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	4.30E-03	Howard, 1989
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	9.50E-02	CHEMFATE, 1999
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	9.50E-02	CHEMFATE, 1999
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	72.5	U.S. EPA, 1997c
t <sub>c</sub>	Critical temperature (degrees C)	251.85	Reid et al., 1977
AntB	Antoine's B constant (degrees C)	2744.68	Reid et al., 1977
AntC	Antoine's C constant (degrees C)	-329.3	Reid et al., 1977
P <sub>c</sub>	Critical pressure (atm)	43	Reid et al., 1977
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-41. Chemical-Specific Inputs for Vinyl acetate (108-05-4)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	7.28E-01	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	1.47E+01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.47E+01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	1.47E+01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	1.47E+01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.47E+01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.47E+01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	0.00E+00	ID; Default value
Ba_Milk	Milk biotransfer factor (day/kg)	0.00E+00	ID; Default value
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	1.25E+00	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	1.54E+00	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

**Table D-42. Chemical-Specific Inputs for Xylene (mixed isomers) (1330-20-7)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	106.17	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	7.99	Average of isomers; U.S. EPA, 1997
S	Water solubility (mg/L)	175	Average of isomers; U.S. EPA, 1997
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	6.73E-03	Average of isomers; U.S. EPA, 1997
Da	Diffusivity in air (cm <sup>2</sup> /s)	7.14E-02	U.S. EPA, 1995
Dw	Diffusivity in water (cm <sup>2</sup> /s)	9.34E-06	U.S. EPA, 1995
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	1.47E+03	Average of isomers; U.S. EPA, 1997
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	1.20E+03	Average of isomers; Kollig, 1993
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Calculated	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	2.48E-02	Howard et al., 1991
K <sub>sg</sub>	Degradation rate in soil (1/yr)	2.48E-02	Howard et al., 1991
k <sub>gs</sub>	Degradation rate in sediment (1/yr)	1.90E-03	Howard et al., 1991
K <sub>h_LFs</sub>	Hydrolysis rate in landfills (1/yr)	0	Calculated based on U.S. EPA, 1997
K <sub>h_tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	0	Calculated based on U.S. EPA, 1997
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	20	Default Value
t <sub>b</sub>	Boiling point (degrees C)	140.6	Average of isomers; U.S. EPA, 1997
t <sub>c</sub>	Critical temperature (degrees C)	347.98	Average of isomers; Reid et al., 1977
AntB	Antoine's B constant (degrees C)	3369.74	Average of isomers; U.S. EPA, 1997
AntC	Antoine's C constant (degrees C)	-331.6	Average of isomers; U.S. EPA, 1997
P <sub>c</sub>	Critical pressure (atm)	35.5	Average of isomers; U.S. EPA, 1997
<b>Biotransfer Factors - Plants</b>			
B <sub>v_Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
B <sub>v_Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
K <sub>p_Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
K <sub>p_Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	119.35	U.S. EPA, 1998

**Table D-42. Chemical-Specific Inputs for Xylene (mixed isomers) (1330-20-7)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	8.30E+00	Calculated based on U.S. EPA, 1998
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	5.72E-01	Calculated based on U.S. EPA, 1998
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	5.72E-01	Calculated based on U.S. EPA, 1998
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	5.72E-01	Calculated based on U.S. EPA, 1998
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	5.72E-01	Calculated based on U.S. EPA, 1998
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	5.72E-01	Calculated based on U.S. EPA, 1998
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	5.72E-01	Calculated based on U.S. EPA, 1998
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	NA	
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	3.69E-05	Calculated based on U.S. EPA, 1998
Ba_Milk	Milk biotransfer factor (day/kg)	1.17E-05	Calculated based on U.S. EPA, 1998
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	2.29E+01	Calculated based on U.S. EPA, 1998
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	3.69E+01	Calculated based on U.S. EPA, 1998
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

The average values for the isomers were used for all parameters with no single value reported for mixed isomers.

**Table D-43. Chemical-Specific Inputs for Zinc (7440-66-6)**

Parameter	Definition	Value	Reference
<b>Chemical/Physical Properties</b>			
MW	Molecular weight (g/mol)	65.38	U.S. EPA, 1997c
VP	Vapor pressure (Torr)	NA	
S	Water solubility (mg/L)	NA	
HLC	Henry's Law Constant (atm·m <sup>3</sup> /mol)	NA	
Da	Diffusivity in air (cm <sup>2</sup> /s)	NA	
Dw	Diffusivity in water (cm <sup>2</sup> /s)	NA	
K <sub>ow</sub>	Octanol-water partition coefficient (unitless)	NA	
K <sub>oc</sub>	Organic carbon partition coefficient (unitless)	NA	
K <sub>d</sub>	Soil water partition coefficient (mL/g)	Distribution	See Section 4
<b>Chemical/Physical Properties - Degradation Rates</b>			
kgw	Degradation rate in surface water (1/yr)	NA	
Ksg	Degradation rate in soil (1/yr)	NA	
kgs	Degradation rate in sediment (1/yr)	NA	
Kh <sub>LFs</sub>	Hydrolysis rate in landfills (1/yr)	NA	
Kh <sub>tanks</sub>	Hydrolysis rate in Tanks and Surface Impoundments (1/yr)	NA	
<b>Chemical/Physical Properties - Temperature Correction Routines for Source Models</b>			
ChemTemp	Parameter temperature (degrees C)	NA	
tb	Boiling point (degrees C)	NA	
tc	Critical temperature (degrees C)	NA	
AntB	Antoine's B constant (degrees C)	NA	
AntC	Antoine's C constant (degrees C)	NA	
Pc	Critical pressure (atm)	NA	
<b>Biotransfer Factors - Plants</b>			
Bv <sub>Exveg</sub>	Air to plant, exposed vegetation (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Exfruit</sub>	Air to plant, exposed fruit (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Forage</sub>	Air to plant, forage (ug/g DW plant)/(ug/g air)	NA	
Bv <sub>Silage</sub>	Air to plant, silage (ug/g DW plant)/(ug/g air)	NA	
Kp <sub>Par</sub>	Plant surface loss coefficient - particulates (1/yr)	18.07	U.S. EPA, 1997d
Kp <sub>Vap</sub>	Plant surface loss coefficient - vapors (1/yr)	NA	

**Table D-43. Chemical-Specific Inputs for Zinc (7440-66-6)**

Parameter	Definition	Value	Reference
<b>Biotransfer Factors - Plants (continued)</b>			
RCF	Root concentration factor (ug/g WW plant)/(ug/ml soil water)	NA	
Br_Exveg	Soil to plant, exposed vegetables (ug/g DW plant)/(ug/g soil)	3.70E-01	U.S. EPA, 1999b
Br_Exfruit	Soil to plant, exposed fruit (ug/g DW plant)/(ug/g soil)	1.50E+00	Baes et al., 1984
Br_Profruit	Soil to plant, protected fruit (ug/g DW plant)/(ug/g soil)	9.00E-01	Baes et al., 1984
Br_Forage	Soil to plant, forage (ug/g DW plant)/(ug/g soil)	2.90E-01	U.S. EPA, 1999b
Br_Grain	Soil to plant, grain (ug/g DW plant)/(ug/g soil)	1.80E-01	U.S. EPA, 1999b
Br_Silage	Soil to plant, silage (ug/g DW plant)/(ug/g soil)	1.60E+00	U.S. EPA, 1999b
Br_Root	Soil to plant, roots (ug/g DW plant)/(ug/g soil)	2.30E-01	U.S. EPA, 1999b
<b>Biotransfer Factors - Food Chain</b>			
Ba_Beef	Beef biotransfer factor (day/kg)	1.00E-01	Baes et al., 1984
Ba_Milk	Milk biotransfer factor (day/kg)	1.00E-02	Baes et al., 1984
BCF_T3F	Trophic level 3 fish bioconcentration factor (L/kg)	4.4	Stephan, 1993
BCF_T4F	Trophic level 4 fish bioconcentration factor (L/kg)	4.4	Stephan, 1993
<b>Additional Source Modeling Parameters</b>			
FracNeutral	Fraction of constituent in the neutral species (unitless)	1	U.S. EPA, 1996
<b>Additional Fate and Transport Modeling Parameters</b>			
F_w	Fraction of wet deposition adhering to plant surface (unitless)	0.6	U.S. EPA, 1997d
Vdv	Dry deposition velocity (cm/s)	0.2	Koester and Hites, 1992

ID = Insufficient data.

NA = Not applicable.

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*Appendix D***References**

- Baes, C.F., R.D. Sharp, A.L. Sjoreen, and R.W. Shor. 1984. *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides Through Agriculture.* ORNL-5786. Prepared for U.S. Department of Energy. Oak Ridge National Laboratory, Oak Ridge, TN. September.
- Budavari, S. (ed.). 1989. *The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals.* 11th edition. Merck and Co., Inc., Rahway, NJ.
- ChemFinder.com. 1999. ChemFinder.com Database and Internet Searching.  
<http://www.chemfinder.com>.
- Howard, P.H. 1989. *Handbook of Environmental Fate and Exposure Data for Organic Chemicals.* Chelsea, MI: Lewis Publishers, Inc.
- Howard, P.H., R.S. Boethling, W.F. Jarvis, W.M. Meylan, and E.M. Michalenko, and Printup, H.T. (ed.) 1991. *Handbook of Environmental Degradation Rates.* Chelsea, MI: Chelsea, Michigan.
- Koester, C.J., and R.A. Hites. 1992. Wet and dry deposition of chlorinated dioxins and furans. *Environmental Science and Technology* 26:1375-1382.
- Kollig, H.P. 1993. *Environmental Fate Constants for Organic Chemicals Under Consideration for EPA's Hazardous Waste Identification Projects.* EPA/600/R-93/132. U.S. Environmental Protection Agency, Office of Research and Development, Environmental Research Laboratory, Athens, GA. August.
- Lemly, A.D. 1985. Toxicology of selenium in a freshwater reservoir: implications for environmental hazard evaluation and safety. *Ecotoxicology and Environmental Safety* 10:314-338.
- Lyman, W.J., W.F. Reehl, and D.H. Rosenblatt. 1990. *Handbook of Chemical Property Estimation Methods: Environmental Behavior of Organic Compounds.* Washington, DC: American Chemical Society.
- Reid, R.C., J.M. Prausnitz, and T.K. Sherwood. 1977. *The Properties of Gases and Liquids.* New York: McGraw-Hill Book Company.
- SRC (Syracuse Research Corporation). 1999. CHEMFATE Chemical Search, Environmental Science Center, Syracuse, NY. [http://esc\\_plaza.syrres.com/efdb/Chemfate.htm](http://esc_plaza.syrres.com/efdb/Chemfate.htm).

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*Appendix D*

- Stephan, C.E. 1993. *Derivation of Proposed Human Health and Wildlife Bioaccumulation Factors for the Great Lakes Initiative*. Draft. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Duluth, MN. March.
- U.S. EPA (Environmental Protection Agency). 1995. WATER8. Version 4.0. Office of Air Quality Planning and Standards, Research Triangle Park, NC. Website at <http://www.epa.gov/ttn/chief/software.html>. May 1.
- U.S. EPA (Environmental Protection Agency). 1996a. *Soil Screening Guidance Technical Background Document*. EPA/540/R/95/128. Office of Solid Waste and Emergency Response, Washington, DC. May.
- U.S. EPA (Environmental Protection Agency). 1996b. Superfund Chemical Data Matrix (SCDM). Superfund Internet Site, Washington, DC. Website at <http://www.epa.gov/oerrpage/superfund/resources/scdm/index.htm>.
- U.S. EPA (Environmental Protection Agency). 1997a. *EPA's Composite Model for Leachate Migration with Transformation Products. EPACMTP: User's Guide*. Office of Solid Waste, Washington, DC.
- U.S. EPA (Environmental Protection Agency). 1997b. *Mercury Study Report to Congress. Volume III - Fate and Transport of Mercury in the Environment*. EPA 452/R-97/005. Office of Air Quality Planning and Standards and Office of Research and Development, Washington, DC.
- U.S. EPA (Environmental Protection Agency). 1997c. *The Parameter Guidance Document. A companion Document to the Methodology for Assessing Health Risks Associated with Multiple Pathways Exposure to Combustor Emissions* (Internal Draft). NCEA-0238. National Center for Environmental Assessment, Cincinnati, OH. March.
- U.S. EPA (Environmental Protection Agency). 1998. *Methodology for Assessing Health Risks Associated with Multiple Pathways of Exposure to Combustor Emissions. Update to EPA/600/6-90/003 Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions*. EPA 600/R-98/137. National Center for Environmental Assessment, Cincinnati, OH.
- U.S. EPA (Environmental Protection Agency). 1999a. Chemical Data Base for HWIR99. Office of Solid Waste, Washington, DC. October.
- U.S. EPA (Environmental Protection Agency). 1999b. *Data Collection for the Hazardous Waste Identification Rule. Section 10. Farm Food Chain and Terrestrial Foodweb Data*. Office of Solid Waste, Washington, DC. October.

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U.S. EPA (Environmental Protection Agency). 1999c. ECOTOX (ECOlogical TOXicity Database). National Health and Environmental Effects Research Laboratory, Mid-Continent Ecology Division and Western Ecology Division, Duluth, MN. Website at <http://www.epa.gov/medecotx/>. January 28.

Weast, R.C. (ed.). 1979. *CRC Handbook of Chemistry and Physics*. 60th edition. Boca Raton, FL: CRC Press.



## **Appendix E**

### **Waste Management Unit Parameters**

Table E-1 Landfill Data from the Industrial D Survey

Table E-2 Derived Landfill Parameters

Table E-3 Surface Impoundment Data from the Industrial D Survey

Table E-4 Derived Surface Impoundment Parameters

Table E-5 Tank-Specific Parameters

NOTE: Data provided in this appendix are for the 68 landfills and 200 treatment tanks and surface impoundments used in this analysis.



**Table E-1. Landfill Data from the Industrial D Survey**

<b>Landfill IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Landfill Receives Wast from Off-site</b>	<b>Number of Landfills at Facility</b>	<b>Total Surface Area for all Landfills at Facility (acres)</b>	<b>Total Capacity for all Landfills at Facility (Mton or Mg)</b>	<b>Landfill Total Capacity Replaced</b>
0131003	1	LA	1	1	7.35	101,606	
0131508	1	TN	1	1	110	3,746,855	
0132010	1	WV	1	1	8	152,410	
0132702	1	MI	1	1	152	689,472	
0212602	2	IL	1	1	5	28,020	Yes
0224309	2	TX	1	2	2.5	9,415	Yes
0231104	2	PA	1	1	23.4	181,440	
0232008	2	IN	1	1	17.7	308,448	
0232901	2	MI	1	1	242	1,788,578	Yes
0331906	3	PA	1	1	20	151,937	Yes
0332711	3	GA	1	1	1.03	32,359	Yes
0332806	3	TX	1	1	0.5	3,484	Yes
0420803	4	KY	1	1	20	1,241,934	Yes
0430602	4	AZ	1	1	13	58,061	
0430605	4	TX	1	1	0.13	1,172	
0431211	4	MA	1	1	2	23,224	
0431702	4	CO	1	1	0.005	53	Yes
0432210	4	MI	1	1	400	10,886,400	
0432720	4	KY	1	1	199	1,451,520	
0433316	4	KY	1	1	5	145,152	
0530404	5	KY	1	1	20	364,767	
0631505	6	TN	1	4	38.4	591,132	
0631506	6	TN	1	4	24	315,706	
0632003	6	TX	1	1	3.4	17,237	
0632709	6	UT	1	3	46	208,293	
0713705	7	AZ	1	2	10	383,322	Yes
0716611	7	CO	1	1	2	24,424	Yes
0721708	7	AZ	1	1	22	399,168	
0731609	7	SC	1	1	40	798,336	
0732517	7	IL	1	1	5.5	27,216	
0733903	7	KY	1	2	107	493,574	Yes
0734601	7	CA	1	1	1.3	42,197	Yes
0734714	7	OH	1	1	2	111,061	Yes
0735104	7	GA	1	1	25	141,886	
0821705	8	WI	1	1	36.8	725,760	
0830611	8	NC	1	1	30	1,868,053	Yes
0830615	8	WI	1	1	39	406,426	
0831008	8	ME	1	1	23	475,736	
0831404	8	WI	1	1	13.3	435,456	
0831412	8	NY	1	1	40	544,320	
0832107	8	WI	1	3	48	864,416	
0832207	8	ME	1	1	15	435,456	
0832602	8	MI	1	1	40	217,728	
0832714	8	ME	1	1	70	1,814,400	
0832913	8	GA	1	1	49	394,741	
0833106	8	OR	1	1	40	508,032	
0833306	8	MI	1	1	50	306,180	
0931004	9	AZ	1	1	10	551,680	Yes
0931606	9	AZ	1	5	66.2	272,160	

*Appendix E***Table E-1. Landfill Data from the Industrial D Survey**

<b>Landfill IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Landfill Receives Wast from Off-site</b>	<b>Number of Landfills at Facility</b>	<b>Total Surface Area for all Landfills at Facility (acres)</b>	<b>Total Capacity for all Landfills at Facility (Mton or Mg)</b>	<b>Landfill Total Capacity Replaced</b>
0933102	9	IN	1	1	32	362,880	
0933105	9	GA	1	3	40	1,088,978	
0934805	9	OH	1	1	50	725,760	
0935106	9	PA	1	1	2.62	21,787	Yes
1030105	10	NC	1	2	7	96,163	
1122203	11	CA	1	1	0.23	10,886	
1123302	11	TN	1	1	40	154,792	
1124101	11	PA	1	1	11.48	80,640	
1133305	11	NV	1	1	5.4	250,166	Yes
1230810	12	TX	1	5	1.03	18,144	
1231808	12	LA	1	1	9	81,648	
1231910	12	WA	1	2	15	907,200	
1233216	12	NV	1	1	20	116,271	Yes
1233701	12	SC	1	1	10	272,115	Yes
1236739	12	OH	1	2	0.16	3,952	Yes
1332703	13	MI	1	1	41	1,451,520	
1339913	13	A	1	1	14	51,475	
1532702	15	NJ	1	1	39	1,792,436	Yes
1632703	16	SC	1	1	2	55,140	Yes

Source: Schroeder, K., R. Clickner, and E. Miller. 1987. Screening Survey of Industrial Subtitle D Establishments. Draft Final Report. Prepared for Office of Solid Waste, U.S. Environmental Protection Agency. Westat, Inc., Rockville, MD.

**Table E-2. Derived Landfill Parameters**

<b>Landfill IdNum</b>	<b>Average surface area (m<sup>2</sup>)</b>	<b>Average capacity (Mg)</b>	<b>Depth (m)</b>	<b>Vehicles per day (1/d)</b>	<b>Vehicles weight (Mg)</b>	<b>Distance vehicle travels on LF (m)</b>	<b>Frequency of surface disturbance (1/mo)</b>	<b>Waste loading rate (dry Mg/yr)</b>
0131003	29,745.45	101,606.40	1.90	0.515	24	172.47	15.45	3,386.88
0131508	445,170.00	3,746,855.00	4.68	8.260	50.7	667.21	60.00	124,895.17
0132010	32,376.00	152,409.60	2.62	0.773	24	179.93	23.18	5,080.32
0132702	615,144.00	689,472.00	0.62	3.496	24	784.31	60.00	22,982.40
0212602	20,235.00	28,020.07	0.77	0.142	24	142.25	4.26	934.00
0224309	5,058.75	4,707.28	0.52	0.024	24	71.12	0.72	156.91
0231104	94,699.80	181,440.00	1.06	0.920	24	307.73	27.60	6,048.00
0232008	71,631.90	308,448.00	2.39	1.564	24	267.64	46.92	10,281.60
0232901	979,374.00	1,788,578.02	1.01	3.943	50.7	989.63	60.00	59,619.27
0331906	80,940.00	151,936.95	1.04	0.770	24	284.50	23.11	5,064.56
0332711	4,168.41	32,359.07	4.31	0.164	24	64.56	4.92	1,078.64
0332806	2,023.50	3,483.50	0.96	0.018	24	44.98	0.53	116.12
0420803	80,940.00	1,241,934.24	8.52	2.738	50.7	284.50	60.00	41,397.81
0430602	52,611.00	58,060.80	0.61	0.294	24	229.37	8.83	1,935.36
0430605	526.11	1,172.10	1.24	0.006	24	22.94	0.18	39.07
0431211	8,094.00	23,224.30	1.59	0.118	24	89.97	3.53	774.14
0431702	20.24	52.52	1.44	0.000	24	4.50	0.01	1.75
0432210	1,618,800.00	10,886,400.00	3.74	23.998	50.7	1,272.32	60.00	362,880.00
0432720	805,353.00	1,451,520.00	1.00	3.200	50.7	897.41	60.00	48,384.00
0433316	20,235.00	145,152.00	3.99	0.736	24	142.25	22.08	4,838.40
0530404	80,940.00	364,767.00	2.50	1.849	24	284.50	55.48	12,158.90
0631505	38,851.20	147,782.88	2.11	0.749	24	197.11	22.48	4,926.10
0631506	24,282.00	78,926.40	1.81	0.400	24	155.83	12.00	2,630.88
0632003	13,759.80	17,236.80	0.70	0.087	24	117.30	2.62	574.56
0632709	62,054.00	69,431.03	0.62	0.352	24	249.11	10.56	2,314.37
0713705	20,235.00	191,660.93	5.26	0.972	24	142.25	29.15	6,388.70
0716611	8,094.00	24,424.23	1.68	0.124	24	89.97	3.71	814.14
0721708	89,034.00	399,168.00	2.49	2.024	24	298.39	60.00	13,305.60
0731609	161,880.00	798,336.00	2.74	4.048	24	402.34	60.00	26,611.20
0732517	22,258.50	27,216.00	0.68	0.138	24	149.19	4.14	907.20
0733903	216,514.50	246,786.98	0.63	1.251	24	465.31	37.54	8,226.23
0734601	5,261.10	42,197.11	4.46	0.214	24	72.53	6.42	1,406.57
0734714	8,094.00	111,061.22	7.62	0.563	24	89.97	16.89	3,702.04
0735104	101,175.00	141,886.10	0.78	0.719	24	318.08	21.58	4,729.54
0821705	148,929.60	725,760.00	2.71	3.680	24	385.91	60.00	24,192.00
0830611	121,410.00	1,868,052.92	8.55	4.118	50.7	348.44	60.00	62,268.43
0830615	157,833.00	406,425.60	1.43	2.061	24	397.28	60.00	13,547.52
0831008	93,081.00	475,735.70	2.84	2.412	24	305.09	60.00	15,857.86
0831404	53,825.10	435,456.00	4.49	2.208	24	232.00	60.00	14,515.20
0831412	161,880.00	544,320.00	1.87	2.760	24	402.34	60.00	18,144.00
0832107	64,752.00	288,138.70	2.47	1.461	24	254.46	43.83	9,604.62
0832207	60,705.00	435,456.00	3.99	2.208	24	246.38	60.00	14,515.20
0832602	161,880.00	217,728.00	0.75	1.104	24	402.34	33.12	7,257.60
0832714	283,290.00	1,814,400.00	3.56	4.000	50.7	532.25	60.00	60,480.00
0832913	198,303.00	394,740.90	1.11	2.001	24	445.31	60.00	13,158.03
0833106	161,880.00	508,032.00	1.74	2.576	24	402.34	60.00	16,934.40
0833306	202,350.00	306,180.00	0.84	1.552	24	449.83	46.57	10,206.00
0931004	40,470.00	551,679.89	7.57	2.797	24	201.17	60.00	18,389.33
0931606	53,582.28	54,432.00	0.56	0.276	24	231.48	8.28	1,814.40

*Appendix E***Table E-2. Derived Landfill Parameters**

<b>Landfill IdNum</b>	<b>Average surface area (m<sup>2</sup>)</b>	<b>Average capacity (Mg)</b>	<b>Depth (m)</b>	<b>Vehicles per day (1/d)</b>	<b>Vehicles weight (Mg)</b>	<b>Distance vehicle travels on LF (m)</b>	<b>Frequency of surface disturbance (1/mo)</b>	<b>Waste loading rate (dry Mg/yr)</b>
0933102	129,504.00	362,880.00	1.56	1.840	24	359.87	55.20	12,096.00
0933105	53,960.00	362,992.50	3.74	1.840	24	232.29	55.21	12,099.75
0934805	202,350.00	725,760.00	1.99	3.680	24	449.83	60.00	24,192.00
0935106	10,603.14	21,787.40	1.14	0.110	24	102.97	3.31	726.25
1030105	14,164.50	48,081.60	1.89	0.244	24	119.01	7.31	1,602.72
1122203	930.81	10,886.40	6.50	0.055	24	30.51	1.66	362.88
1123302	161,880.00	154,791.90	0.53	0.785	24	402.34	23.54	5,159.73
1124101	46,459.56	80,639.90	0.96	0.409	24	215.54	12.27	2,688.00
1133305	21,853.80	250,166.13	6.36	1.268	24	147.83	38.05	8,338.87
1230810	833.68	3,628.80	2.42	0.018	24	28.87	0.55	120.96
1231808	36,423.00	81,648.00	1.25	0.414	24	190.85	12.42	2,721.60
1231910	30,352.50	453,600.00	8.30	2.300	24	174.22	60.00	15,120.00
1233216	80,940.00	116,271.28	0.80	0.590	24	284.50	17.69	3,875.71
1233701	40,470.00	272,114.53	3.74	1.380	24	201.17	41.39	9,070.48
1236739	323.76	1,975.88	3.39	0.010	24	17.99	0.30	65.86
1332703	165,927.00	1,451,520.00	4.86	3.200	50.7	407.34	60.00	48,384.00
1339913	56,658.00	51,475.10	0.50	0.261	24	238.03	7.83	1,715.84
1532702	157,833.00	1,792,436.21	6.31	3.951	50.7	397.28	60.00	59,747.87
1632703	8,094.00	55,140.50	3.78	0.280	24	89.97	8.39	1,838.02

Note: See Appendix L for detailed information regarding the derivation of the above parameters.

## Appendix E

**Table E-3. Surface Impoundment (SI) Data from the Industrial D Survey**

<b>SI IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Number of SI at Facility</b>	<b>Number of SI Backup Units at Facility</b>	<b>Total Surface Area for all SI at Facility (acres)</b>	<b>SI Total Capacity (Mton)</b>	<b>SI Total Capacity Replaced</b>	<b>SI 1985 Waste (Mton)</b>	<b>SI Waste</b>
0123101	1	IN	11		0.08	1437.1		36185.2	
0131009	1	TX	8	1	500	2197525.9		5792936.5	
0131709	1	SC	4		36	301912.0		1415212.5	
0131906	1	OH	3	1	0.67	4204.1		161145.5	
0221307	2	KY	1		169	654696.9	Yes	22643.4	
0222402	2	IN	1		1	3689.2		452.9	
0226602	2	NY	1		8.61	16186.8	Yes	2754.9	
0231212	2	PA	2		0.02	352.6		1551.8	Yes
0231311	2	OH	3		28	495513.1		91479.3	
0231806	2	OH	5		150	2262588.9		50313.6	
0232506	2	AL	1		0.38	3297.4		1981297.5	
0233407	2	IN	2		14	33514.6	Yes	11434.9	
0235202	2	MO	1		1.7	14127.3	Yes	8000.7	
0330104	3	FL	8	6	350	3075408.0		8164.8	
0330403	3	AR	3		3.81	18869.5		913283.8	
0331010	3	FL	10		94	626467.4		1249160.9	
0331702	3	FL	4		509	1295957.3		2966285.4	
0332211	3	FL	4	2	260	1886950.0		1923264.0	
0332507	3	LA	1		4.34	21369.4		118877.8	
0420305	4	TN	1		20	87988.4	Yes	300025.0	
0421503	4	TN	2	1	2	4516.9		1750.3	
0422607	4	IL	3		175	4737435.8		204392.2	
0422804	4	SD	5	2	675	17295651.9	Yes	18634084.9	
0430216	4	WV	11		180.84	22441045.2		694387.2	
0430311	4	MO	1		146.92	7481144.6		462672.0	
0430411	4	AR	1		72	885404.9		5132504.0	
0430503	4	MO	1		100	1600888.4		126546.4	
0430504	4	TX	1		80	2258458.8		207312.4	
0430710	4	TN	3	2	1.06	12295.4		836.9	
0430718	4	NE	9		80.74	622882.9		132701.6	
0430907	4	IN	2		133	1773733.0		174182.4	
0430913	4	IL	6		460	11434917.0		8000668.0	
0431317	4	MO	3		37.76	462984.0		53524.8	
0431414	4	IN	3		270	8243374.5		414590.4	
0431501	4	AL	5		346	13569434.8		258444.4	
0431512	4	IL	2		106	3689187.3		56249466.4	
0431612	4	OH	3		236	6097838.6		274246.6	
0431802	4	TX	11		117	2459458.2		12297290.9	
0431907	4	AL	4		647	62377797.7		372297.3	
0431912	4	KS	1		400	9681638.4		463579.2	
0432103	4	KY	3		184	4978000.5		33.2	
0432203	4	MD	3	1	10	18445.9		1056692.0	
0432213	4	WY	1		75	453600.0		36288.0	
0432608	4	IN	6		125	3616135.5		12038741.0	
0432704	4	ND	10	2	600	6860950.2		308742.8	
0432710	4	PA	1		270	785601.5	Yes	2652900.7	
0432716	4	MN	6	2	600	11067561.8		261273.6	
0432805	4	WV	9		180	10672589.2		16529682.0	

## Appendix E

**Table E-3. Surface Impoundment (SI) Data from the Industrial D Survey**

<b>SI IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Number of SI at Facility</b>	<b>Number of SI Backup Units at Facility</b>	<b>Total Surface Area for all SI at Facility (acres)</b>	<b>SI Total Capacity (Mton)</b>	<b>SI Total Capacity Replaced</b>	<b>SI 1985 Waste (Mton)</b>	<b>SI Waste</b>
0432904	4	KY	1		100	245706.1	Yes	7000584.5	
0433103	4	OH	4		175.6	5698259.3		502955.3	
0433117	4	WY	4		47	625108.8		160120.8	
0433201	4	IN	6		348	3778440.0		22039.6	
0433204	4	SC	7		401.4	11301210.3		620104.9	
0433207	4	GA	4		745	25578365.0		191419.2	
0433208	4	SC	1		52	491891.6		20412.0	
0433404	4	WY	9		166.1	3676344.7		35502964.2	
0433408	4	MT	6		525.2	23962501.0		211513.4	
0434104	4	IN	2		129	2591914.5		49924.1	
0434206	4	NC	2		77	1681467.5	Yes	37104.5	
0434804	4	NC	1		145	2090539.5		42094.1	
0436007	4	NC	2		96	287756.6		36197.3	
0436108	4	NC	1		176	5352480.0		2630880.0	
0436403	4	AL	5		80	1967566.5		49189.2	
0436506	4	SC	1		62	1179360.0		34927.2	
0520902	5	TN	1		0.46	1693.8		0.6	
0530505	5	TX	4	2	39.55	349257.2		405584.1	
0531005	5	TN	11	4	29.43	90573.6		1886950.0	
0533001	5	IL	6	4	4.76	13208.6		833829.6	
0620103	6	NM	3	2	672	4248240.8	Yes	3084480.0	
0620604	6	UT	1		300	1411536.7		49060.7	
0620902	6	KY	1		0.06	271.4		236.2	Yes
0621204	6	VT	1		6.89	846922.0		10886.4	
0623804	6	TX	5	1	0.45	1994.6		698.2	
0630102	6	FL	3		1210	57797267.2		15422.4	
0630403	6	TN	6	1	400	13772965.8		737837.5	
0630801	6	TN	3		21.67	133232.0		890398.9	
0630902	6	CT	2		1.84	21511.2		2750229.6	
0631202	6	LA	7	3	385	1316634.5	Yes	498960.0	
0631402	6	TX	1		68.87	349243.1		993384.0	
0631505	6	TN	4	2	47.07	2006917.9		188165.1	
0631903	6	LA	7		500	1106756.2		4000334.0	
0632001	6	LA	1		130	2268000.0		176904.0	
0632408	6	LA	9	1	10.12	74036.4		2651745.6	
0632606	6	TX	5	2	183.66	903383.5		2358687.5	
0633202	6	MT	1		75	2599598.7	Yes	272160.0	
0633208	6	OH	9		106	513046.6		3354242.3	
0633305	6	FL	25		8550	284385919.4		24494400.0	
0634902	6	PA	1		0.8	2830.4		28802.4	
0639959	6	A	4		40	301912.0		1320865.0	
0639962	6	A	6	1	940	14756749.1		356621.4	
0714414	7	SD	1		0.34	721.5	Yes	181.4	
0720803	7	FL	1		0.02	264.2		15095.6	
0721102	7	NE	1		10	516185.7	Yes	762.3	
0723505	7	WI	1		93.1	2743333.4	Yes	0.1	
0723609	7	CT	1		0.03	197.9	Yes	90.7	
0726805	7	MT	1		0.02	343.0		228.7	

## Appendix E

**Table E-3. Surface Impoundment (SI) Data from the Industrial D Survey**

<b>SI IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Number of SI at Facility</b>	<b>Number of SI Backup Units at Facility</b>	<b>Total Surface Area for all SI at Facility (acres)</b>	<b>SI Total Capacity (Mton)</b>	<b>SI Total Capacity Replaced</b>	<b>SI 1985 Waste (Mton)</b>	<b>SI Waste</b>
0730302	7	CA	1		15	806526.9		453.6	
0731112	7	NC	8	1	1.3	15850.4		9434.7	
0731407	7	GA	1		115	1814400.0		272160.0	
0731412	7	MA	1		45.45	259830.5	Yes	22680.0	
0731514	7	IL	7		57	566085.0		5283460.0	
0732105	7	KS	2		5.74	79251.9		188.7	
0733204	7	SC	3		0.08	762.3		15.2	
0733608	7	IL	2	1	14.23	70194.5		52834.6	
0733913	7	VA	2		168	2089074.3		3390056.6	
0734308	7	TX	1		0.02	27.5	Yes	9.1	
0734405	7	AR	1		60	6350400.0		27143.4	
0734703	7	OK	1		161.16	445231.1		70005.8	
0735104	7	GA	7	1	366	3855600.0		184161.6	
0735315	7	SC	2		0.005	162.1	Yes	75478.0	
0820404	8	OR	2		20.02	301912.0		10370865.9	
0823704	8	NY	1		0.02	169.4		228.7	
0825704	8	OR	2	1	20	207564.5		12001002.0	
0830303	8	TX	8		650	5356699.9		68873675.0	
0830502	8	AL	7		371	4528680.0		15501294.2	
0830602	8	OK	1		21	139634.3		12701060.4	
0830808	8	FL	5		267	3552447.5		75851616.1	
0830809	8	TN	3	2	125	11292293.8		101425.0	
0830812	8	AL	12	1	400	3773900.0		56608500.0	
0830908	8	NC	4		200	1132170.0		30191200.0	
0830915	8	FL	5		1050	3773900.8		56608500.0	
0831002	8	AZ	3		3000	20075092.9	Yes	18445936.3	
0831104	8	ME	3	1	36	754780.0		21345.2	
0831405	8	AL	7	3	750	10189530.0		33965100.0	
0831408	8	CA	10	5	11.48	132086.5		152.0	
0831604	8	OH	6	3	100	3773900.0		2000167.0	
0831801	8	NC	1		60	1294447.7		27002.3	
0831901	8	OH	2		16	177373.3		37588044.0	
0832009	8	PA	1		243	2830425.0		7547800.0	
0832206	8	VA	6		2370	42645070.0		44532020.0	
0832208	8	TX	9		3200	39351330.8		45499976.3	
0832209	8	NC	6	1	425	2173766.6		29255.4	
0832605	8	TN	6		300	3773900.0		26002171.0	
0832608	8	ME	4	1	33.33	641563.0		39550472.0	
0832611	8	AR	3		240.59	2958531.0		14936.1	
0832707	8	LA	1		375	2286983.4		40824.0	
0832806	8	WA	1		26	381163.9		0.0	
0833106	8	OR	1		14	137729.7		416613.6	Yes
0833107	8	GA	3	1	3	69817.1		150956.0	
0833108	8	NC	1		434	2242828.8		58473750.1	
0833504	8	AR	6	2	128	1347282.3		18015466.4	
0835001	8	VA	5		42	339651.0		4500375.7	
0835004	8	MS	3		200	2477565.3		7500626.2	
0835402	8	LA	5		556	30787497.5		9872.1	

## Appendix E

**Table E-3. Surface Impoundment (SI) Data from the Industrial D Survey**

<b>SI IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Number of SI at Facility</b>	<b>Number of SI Backup Units at Facility</b>	<b>Total Surface Area for all SI at Facility (acres)</b>	<b>SI Total Capacity (Mton)</b>	<b>SI Total Capacity Replaced</b>	<b>SI 1985 Waste (Mton)</b>	<b>SI Waste</b>
0923611	9	OK	5	3	24.6	169390.5		1162361.2	
0923901	9	AZ	4	1	1679	10298981.1		1682269.4	
0930403	9	NY	1		15000	61727620.8	Yes	150012.5	
0930702	9	TX	9		410	8385605.8		798336.0	
0931203	9	WA	1		33	571745.8		26292.5	
0931503	9	UT	2		300	1509560.0		33965.1	
0931606	9	AZ	5		2747	71881443.9	Yes	15869779.3	
0932104	9	NM	3		126	1822458.5		1886950.0	
0932603	9	MT	5	1	11	35688.8	Yes	1500125.2	
0932604	9	MI	3	1	4306	308448000.0		107956.8	
0932903	9	TX	7	2	775	3515694.5	Yes	1326651.4	Yes
1010504	10	CA	1		11	144653.6	Yes	8680.0	
1013101	10	TX	1		0.005	37.1	Yes	18.1	
1020405	10	FL	1		221.54	3420558.8	Yes	170014.2	
1021601	10	OH	1		0.06	188.7		2.7	
1024804	10	NJ	2		0.25	3019.1		18869.5	
1024809	10	LA	1		200	1233792.0		14515.2	
1029911	10	A	1		52.9	758742.8		1012160.0	
1030505	10	ID	15		440	2721600.0		589.7	
1031003	10	FL	2		1274	9935082.1	Yes	8640721.4	
1031011	10	AR	4	1	3.1	3773.9		1100091.8	
1031216	10	IL	5		61	352482.3		954796.7	
1031901	10	OR	1		0.04	362.3		283042.5	
1032412	10	TX	7		86	2758300.1	Yes	1600133.6	
1032802	10	NC	1		16	84912.7		180015.0	
1033302	10	MD	3	2	12	67930.2		845278.1	
1033808	10	LA	5		130	799323.9		750062.6	
1034814	10	CA	5	1	126	528346.0		1086883.2	
1035206	10	ME	6		11.31	140728.7		3483.1	
1120201	11	FL	3		3.44	18529.2		550479.9	
1126803	11	NY	2	1	0.82	15095.6		7623.3	
1131503	11	FL	1		10	69817.1		600050.1	
1212402	12	IN	1		0.005	31.1	Yes	0.0	
1222502	12	NJ	3		1	2721.6		3628.8	
1230205	12	NM	1		1200	1814400.0		593725.3	Yes
1230710	12	CA	1		0.41	11321.7		37739.0	
1231216	12	IL	4	1	41	426450.7		943475.0	
1231611	12	TX	4	1	370	904218.5	Yes	52164.0	
1231804	12	CA	7	3	27.55	194355.8		6815663.4	
1231808	12	LA	7		57	107488.2		14515200.0	
1232113	12	NM	1		90	614864.5		688736.7	
1233101	12	CA	1		0.38	4717.4		26.8	
1234706	12	TX	4	2	30	1044537.2		91467.6	
1236652	12	CT	1		0.03	207.6		100.0	
1325106	13	CA	2		0.005	21.4	Yes	83.0	
1421402	14	TN	1		0.02	153.5	Yes	0.1	
1434107	14	FL	4	2	1	5660.8		37739.0	
1436012	14	CA	1		0.005	106.9	Yes	18.1	

## Appendix E

**Table E-3. Surface Impoundment (SI) Data from the Industrial D Survey**

<b>SI IdNum</b>	<b>Industry</b>	<b>State</b>	<b>Number of SI at Facility</b>	<b>Number of SI Backup Units at Facility</b>	<b>Total Surface Area for all SI at Facility (acres)</b>	<b>SI Total Capacity (Mton)</b>	<b>SI Total Capacity Replaced</b>	<b>SI 1985 Waste (Mton)</b>	<b>SI Waste</b>
1436413	14	MI	5		51.15	257760.4	Yes	67931.1	
1532001	15	TX	6	1	18.46	193223.7		10423522.2	
1622403	16	MA	2		0.54	5660.8		196242.8	
1630104	16	NC	5	2	6.6	132086.5		951022.8	
1630105	16	SC	1		8	116990.9		3400283.9	
1631805	16	SC	3		1.7	9057.4		6566.6	
1632201	16	NC	1		9.92	32949.2	Yes	49060.7	
1634402	16	NC	1		0.01	50.8		355.7	

Source: Schroeder, K., R. Clickner, and E. Miller. 1987. Screening Survey of Industrial Subtitle D Establishments. Draft Final Report. Prepared for Office of Solid Waste, U.S. Environmental Protection Agency. Westat, Inc., Rockville, MD.

**Table E-4. Derived Surface Impoundment (SI) Parameters**

<b>SI IdNum</b>	<b>Aeration Characteristics</b>	<b>Source Depth (m)</b>	<b>Average SI Surface Area (m<sup>2</sup>)</b>	<b>Fraction of SI Occupied by Sediments (fraction)</b>	<b>Volumetric Influent Flow Rate (m<sup>3</sup>/s)</b>	<b>Volumetric Influent Flow Rate Replaced</b>
0123101	LO	4.44	29.43	0.73	1.04E-04	
0131009	LO	1.09	252937.50	0.20	2.29E-02	
0131709	NO	2.07	36423.00	0.42	1.12E-02	
0131906	LO	1.55	903.83	0.23	1.70E-03	
0221307	LO	0.96	683943.00	0.20	7.18E-04	
0222402	LO	0.91	4047.00	0.20	1.44E-05	
0226602	NO	0.46	34844.67	0.20	8.73E-05	
0231212	NO	4.36	40.47	0.72	2.46E-05	
0231311	LO	4.37	37772.00	0.73	9.66E-04	
0231806	NO	3.73	121410.00	0.68	3.19E-04	
0232506	NO	2.14	1537.86	0.44	6.28E-02	
0233407	LO	0.59	28329.00	0.20	1.81E-04	
0235202	LO	2.05	6879.90	0.42	2.54E-04	
0330104	LO	2.17	177056.25	0.45	2.44E-04	Yes
0330403	LO	1.22	5139.69	0.20	9.65E-03	
0331010	LO	1.65	38041.80	0.27	3.96E-03	
0331702	LO	0.63	514980.75	0.20	2.35E-02	
0332211	LO	1.79	263055.00	0.33	1.52E-02	
0332507	LO	1.22	17563.98	0.20	3.77E-03	
0420305	LO	1.09	80940.00	0.20	9.51E-03	
0421503	LO	0.56	4047.00	0.20	2.77E-05	
0422607	NO	6.69	236075.00	0.76	2.16E-03	
0422804	HI	6.33	546345.00	0.76	1.18E-01	
0430216	LO	30.66	66532.68	0.76	2.00E-03	
0430311	LO	12.58	594585.24	0.76	1.47E-02	
0430411	LO	3.04	291384.00	0.61	1.63E-01	
0430503	LO	3.96	404700.00	0.70	4.01E-03	
0430504	LO	6.98	323760.00	0.76	6.57E-03	
0430710	LO	2.87	1429.94	0.58	8.84E-06	
0430718	NO	1.91	36306.09	0.37	4.67E-04	
0430907	NO	3.30	269125.50	0.64	2.76E-03	
0430913	LO	6.14	310270.00	0.76	4.23E-02	
0431317	LO	3.03	50938.24	0.60	5.65E-04	
0431414	NO	7.54	364230.00	0.76	4.38E-03	
0431501	LO	9.69	280052.40	0.76	1.72E-03	Yes
0431512	LO	8.60	214491.00	0.76	8.91E-01	
0431612	NO	6.38	318364.00	0.76	2.90E-03	
0431802	LO	5.19	43045.36	0.76	3.54E-02	
0431907	NO	23.82	654602.25	0.76	9.88E-03	Yes
0431912	NO	5.98	1618800.00	0.76	1.47E-02	
0432103	NO	6.69	248216.00	0.76	1.05E-03	Yes
0432203	LO	0.46	13490.00	0.20	1.12E-02	
0432213	LO	1.49	303525.00	0.20	1.15E-03	
0432608	LO	7.15	84312.50	0.76	6.36E-02	
0432704	LO	2.83	242820.00	0.58	9.78E-04	
0432710	LO	0.72	1092690.00	0.20	8.41E-02	
0432716	NO	4.56	404700.00	0.74	1.38E-03	
0432805	NO	14.65	80940.00	0.76	5.82E-02	

**Table E-4. Derived Surface Impoundment (SI) Parameters**

<b>SI IdNum</b>	<b>Aeration Characteristics</b>	<b>Source Depth (m)</b>	<b>Average SI Surface Area (m<sup>2</sup>)</b>	<b>Fraction of SI Occupied by Sediments (fraction)</b>	<b>Volumetric Influent Flow Rate (m<sup>3</sup>/s)</b>	<b>Volumetric Influent Flow Rate Replaced</b>
0432904	NO	0.61	404700.00	0.20	2.22E-01	
0433103	NO	8.02	177663.30	0.76	3.98E-03	
0433117	LO	3.29	47552.25	0.63	1.27E-03	
0433201	NO	2.68	234726.00	0.55	3.99E-04	Yes
0433204	NO	6.96	232066.54	0.76	2.81E-03	
0433207	LO	8.48	753753.75	0.76	4.05E-03	Yes
0433208	NO	2.34	210444.00	0.49	6.47E-04	
0433404	LO	5.47	74689.63	0.76	1.25E-01	
0433408	LO	11.27	354247.40	0.76	2.53E-03	Yes
0434104	LO	4.96	261031.50	0.76	8.21E-04	Yes
0434206	NO	5.40	155809.50	0.76	5.88E-04	
0434804	NO	3.56	586815.00	0.66	1.33E-03	
0436007	LO	0.74	194256.00	0.20	5.74E-04	
0436108	LO	7.51	712272.00	0.76	8.34E-02	
0436403	NO	6.08	64752.00	0.76	3.12E-04	
0436506	NO	4.70	250914.00	0.74	1.11E-03	
0520902	LO	0.91	1861.62	0.20	1.07E-06	Yes
0530505	LO	2.18	40014.71	0.45	3.21E-03	
0531005	NO	0.76	10827.56	0.20	5.44E-03	
0533001	NO	0.69	3210.62	0.20	4.40E-03	
0620103	HI	1.56	906528.00	0.23	3.26E-02	
0620604	LO	1.16	1214100.00	0.20	1.55E-03	
0620902	NO	1.12	242.82	0.20	7.49E-06	
0621204	LO	30.37	27883.83	0.76	5.37E-04	Yes
0623804	LO	1.10	364.23	0.20	4.42E-06	
0630102	LO	11.80	1632290.00	0.76	1.22E-02	Yes
0630403	NO	8.51	269800.00	0.76	3.90E-03	
0630801	LO	1.52	29232.83	0.21	9.41E-03	
0630902	LO	2.89	3723.24	0.58	4.36E-02	
0631202	NO	0.85	222585.00	0.20	2.26E-03	
0631402	LO	1.25	278716.89	0.20	3.15E-02	
0631505	LO	10.54	47623.07	0.76	1.49E-03	
0631903	NO	0.55	289071.43	0.20	1.81E-02	
0632001	LO	4.31	526110.00	0.72	5.61E-03	
0632408	LO	1.81	4550.63	0.34	9.34E-03	
0632606	LO	1.22	148654.40	0.20	1.49E-02	
0633202	LO	8.56	303525.00	0.76	8.62E-03	
0633208	NO	1.20	47664.67	0.20	1.18E-02	
0633305	LO	8.22	1384074.00	0.76	3.10E-02	
0634902	LO	0.87	3237.60	0.20	9.13E-04	
0639959	LO	1.87	40470.00	0.36	1.05E-02	
0639962	LO	3.88	634030.00	0.69	1.88E-03	
0714414	LO	0.52	1375.98	0.20	5.75E-06	
0720803	LO	3.26	80.94	0.63	4.78E-04	
0721102	LO	12.75	40470.00	0.76	3.27E-04	Yes
0723505	LO	7.28	376775.70	0.76	1.74E-03	Yes
0723609	NO	1.63	121.41	0.26	2.87E-06	
0726805	LO	4.24	80.94	0.72	7.25E-06	

**Table E-4. Derived Surface Impoundment (SI) Parameters**

<b>SI IdNum</b>	<b>Aeration Characteristics</b>	<b>Source Depth (m)</b>	<b>Average SI Surface Area (m<sup>2</sup>)</b>	<b>Fraction of SI Occupied by Sediments (fraction)</b>	<b>Volumetric Influent Flow Rate (m<sup>3</sup>/s)</b>	<b>Volumetric Influent Flow Rate Replaced</b>
0730302	LO	13.29	60705.00	0.76	5.11E-04	
0731112	NO	3.01	657.64	0.60	3.74E-05	
0731407	LO	3.90	465405.00	0.69	8.62E-03	
0731412	LO	1.41	183936.15	0.20	7.19E-04	
0731514	NO	2.45	32954.14	0.51	2.39E-02	
0732105	LO	3.41	11614.89	0.65	2.51E-05	Yes
0733204	LO	2.35	107.92	0.49	1.61E-07	Yes
0733608	NO	1.22	28794.41	0.20	8.37E-04	
0733913	LO	3.07	339948.00	0.61	5.37E-02	
0734308	LO	0.34	80.94	0.20	2.88E-07	
0734405	LO	26.15	242820.00	0.76	4.02E-03	Yes
0734703	LO	0.68	652214.52	0.20	2.22E-03	
0735104	LO	2.60	211600.29	0.54	8.34E-04	
0735315	LO	8.01	10.12	0.76	1.20E-03	
0820404	LO	3.73	40510.47	0.68	1.64E-01	
0823704	LO	2.09	80.94	0.43	7.25E-06	
0825704	LO	2.56	40470.00	0.53	1.90E-01	
0830303	LO	2.04	328818.75	0.41	2.73E-01	
0830502	LO	3.02	214491.00	0.60	7.02E-02	
0830602	LO	1.64	84987.00	0.27	4.02E-01	
0830808	LO	3.29	216109.80	0.63	4.81E-01	
0830809	NO	22.32	168625.00	0.76	2.39E-03	Yes
0830812	LO	2.33	134900.00	0.49	1.49E-01	
0830908	LO	1.40	202350.00	0.20	2.39E-01	
0830915	LO	0.89	849870.00	0.20	3.59E-01	
0831002	LO	1.65	4047000.00	0.27	1.95E-01	
0831104	LO	5.18	48564.00	0.76	2.25E-04	
0831405	NO	3.36	433607.14	0.64	1.54E-01	
0831408	LO	2.84	4645.96	0.58	8.37E-06	Yes
0831604	LO	9.33	67450.00	0.76	1.06E-02	
0831801	NO	5.33	242820.00	0.76	8.56E-04	
0831901	NO	2.74	32376.00	0.56	5.96E-01	
0832009	NO	2.88	983421.00	0.58	2.39E-01	
0832206	LO	4.45	1598565.00	0.73	2.35E-01	
0832208	HI	3.04	1438933.33	0.61	1.60E-01	
0832209	LO	1.26	286662.50	0.20	2.30E-04	Yes
0832605	NO	3.11	202350.00	0.61	1.37E-01	
0832608	NO	4.76	33721.63	0.75	3.13E-01	
0832611	NO	3.04	324555.91	0.61	6.25E-04	Yes
0832707	NO	1.51	1517625.00	0.20	1.45E-03	Yes
0832806	NO	3.62	105222.00	0.67	2.42E-04	Yes
0833106	LO	2.43	56658.00	0.51	1.32E-02	
0833107	NO	5.75	4047.00	0.76	1.59E-03	
0833108	LO	1.28	1756398.00	0.20	1.85E+00	
0833504	NO	2.60	86336.00	0.54	9.51E-02	
0835001	LO	2.00	33994.80	0.40	2.85E-02	
0835004	LO	3.06	269800.00	0.61	7.92E-02	
0835402	NO	13.68	450026.40	0.76	3.90E-03	Yes

**Table E-4. Derived Surface Impoundment (SI) Parameters**

<b>SI IdNum</b>	<b>Aeration Characteristics</b>	<b>Source Depth (m)</b>	<b>Average SI Surface Area (m<sup>2</sup>)</b>	<b>Fraction of SI Occupied by Sediments (fraction)</b>	<b>Volumetric Influent Flow Rate (m<sup>3</sup>/s)</b>	<b>Volumetric Influent Flow Rate Replaced</b>
0923611	LO	1.70	19911.24	0.29	7.37E-03	
0923901	LO	1.52	1698728.25	0.21	1.33E-02	
0930403	LO	1.02	60705000.00	0.20	3.91E-02	Yes
0930702	LO	5.05	184363.33	0.76	2.81E-03	
0931203	LO	4.28	133551.00	0.72	8.33E-04	
0931503	NO	1.24	607050.00	0.20	5.38E-04	
0931606	LO	6.47	2223421.80	0.76	1.01E-01	
0932104	LO	3.57	169974.00	0.66	1.99E-02	
0932603	LO	0.80	8903.40	0.20	9.51E-03	
0932604	LO	17.70	5808794.00	0.76	6.52E-02	Yes
0932903	HI	1.12	448060.71	0.20	6.01E-03	
1010504	LO	3.25	44517.00	0.63	2.75E-04	
1013101	LO	1.83	20.24	0.35	5.74E-07	
1020405	LO	3.82	896572.38	0.69	5.39E-03	
1021601	LO	0.78	242.82	0.20	1.20E-07	Yes
1024804	NO	2.98	505.88	0.60	2.99E-04	
1024809	HI	1.52	809400.00	0.21	7.82E-04	Yes
1029911	NO	3.54	214086.30	0.66	3.21E-02	
1030505	NO	1.53	118712.00	0.21	1.15E-04	Yes
1031003	LO	1.93	2577939.00	0.38	1.37E-01	
1031011	NO	0.30	3136.43	0.20	8.71E-03	
1031216	LO	1.43	49373.40	0.20	6.05E-03	
1031901	LO	2.24	161.88	0.46	8.97E-03	
1032412	NO	7.93	49720.29	0.76	7.24E-03	
1032802	LO	1.31	64752.00	0.20	5.70E-03	
1033302	LO	1.40	16188.00	0.20	8.93E-03	
1033808	LO	1.52	105222.00	0.21	4.75E-03	
1034814	HI	1.04	101984.40	0.20	6.89E-03	
1035206	LO	3.07	7628.60	0.61	1.84E-05	
1120201	NO	1.33	4640.56	0.20	5.81E-03	
1126803	NO	4.55	1659.27	0.74	1.21E-04	
1131503	LO	1.73	40470.00	0.30	1.90E-02	
1212402	LO	1.54	20.24	0.22	1.97E-08	Yes
1222502	HI	0.67	1349.00	0.20	3.83E-05	
1230205	LO	0.37	4856400.00	0.20	1.88E-02	
1230710	NO	6.82	1659.27	0.76	1.20E-03	
1231216	NO	2.57	41481.75	0.53	7.47E-03	
1231611	LO	0.60	374347.50	0.20	4.13E-04	
1231804	LO	1.74	15927.84	0.31	3.09E-02	
1231808	NO	0.47	32954.14	0.20	6.57E-02	
1232113	NO	1.69	364230.00	0.29	2.18E-02	
1233101	LO	3.07	1537.86	0.61	2.99E-06	Yes
1234706	NO	8.60	30352.50	0.76	7.25E-04	
1236652	NO	1.71	121.41	0.30	3.17E-06	
1325106	LO	1.06	10.12	0.20	1.32E-06	
1421402	HI	1.90	80.94	0.37	9.73E-08	Yes
1434107	LO	1.40	1011.75	0.20	2.99E-04	
1436012	NO	5.28	20.24	0.76	5.74E-07	

**Table E-4. Derived Surface Impoundment (SI) Parameters**

<b>SI IdNum</b>	<b>Aeration Characteristics</b>	<b>Source Depth (m)</b>	<b>Average SI Surface Area (m<sup>2</sup>)</b>	<b>Fraction of SI Occupied by Sediments (fraction)</b>	<b>Volumetric Influent Flow Rate (m<sup>3</sup>/s)</b>	<b>Volumetric Influent Flow Rate Replaced</b>
1436413	LO	1.25	41400.81	0.20	4.31E-04	
1532001	NO	2.59	12451.27	0.54	5.51E-02	
1622403	LO	2.59	1092.69	0.54	3.11E-03	
1630104	LO	4.95	5342.04	0.76	6.03E-03	
1630105	NO	3.61	32376.00	0.67	1.08E-01	
1631805	NO	1.32	2293.30	0.20	6.94E-05	
1632201	LO	0.82	40146.24	0.20	1.55E-03	
1634402	LO	1.26	40.47	0.20	1.13E-05	

Note: See Appendix L for detailed information regarding the derivation of the above parameters.

**Table E-5. Tank-Specific Parameters**

Tank ID Number	Aeration Characteristics	Source Depth (m)	Area of the Source (m <sup>2</sup> )	Volumetric Influent Flow Rate (m <sup>3</sup> /s)	Volumetric Influent Flow Rate Replaced	Fraction Surface Area Turbulent (fraction)	Number of Impellers/Aerators	Total Power of Impellers/Aerators (hp)
T000190_005	LO	2.58	22.00	2.26E-05		0.200	1	0.55
T000950_003	LO	2.65	17.12	1.19E-03		0.445	1	0.35
T001875_004	LO	2.34	32.30	3.79E-05		0.567	1	0.45
T003129_008	LO	3.03	115.37	3.22E-03		0.711	1	2.80
T003228_008	LO	2.63	5.03	1.09E-02		0.608	1	0.25
T003301_011	LO	2.69	14.05	9.60E-04		0.550	1	0.45
T004911_003	NO	1.47	3.60	4.20E-03		0.000	0	0.00
T004978_007	LO	2.48	6.01	1.53E-04		0.800	1	0.25
T005603_002	LO	1.93	3.92	1.44E-06		0.599	1	0.25
T006221_002	NO	3.84	171.39	2.53E-02		0.062	1	0.49
T006221_004	LO	3.04	7.21	2.52E-02		0.800	1	0.27
T006221_009	LO	3.62	41.84	7.64E-05		0.204	1	1.18
T006221_010	LO	2.81	53.87	7.64E-05		0.630	1	1.20
T006353_005	LO	3.21	47.19	2.96E-02		0.200	1	0.56
T006353_006	LO	3.54	42.78	2.96E-02		0.358	1	0.99
T006353_007	NO	3.66	103.44	2.96E-02		0.000	0	0.00
T006353_010	NO	3.40	222.35	1.78E-03		0.000	0	0.00
T006353_011	NO	3.43	220.95	1.78E-03		0.000	0	0.00
T007245_003	NO	4.76	212.45	5.04E-03		0.051	1	0.99
T007245_004	NO	3.51	80.82	5.04E-04		0.048	1	0.25
T007245_007	NO	4.05	249.70	5.04E-04		0.043	1	0.58
T007302_001	LO	4.25	222.72	2.44E-02		0.585	1	5.40
T008128_004	LO	2.58	80.75	2.81E-03		0.800	1	1.72
T008128_005	LO	3.66	56.82	2.81E-03		0.492	1	1.91
T008524_018	NO	2.64	9.69	1.66E-04		0.000	0	0.00
T008961_005	LO	2.12	15.50	1.09E-05		0.225	1	0.25
T008961_008	LO	3.23	58.67	4.80E-04		0.290	1	1.59
T008961_010	LO	2.48	30.56	4.80E-06		0.528	1	0.86
T008961_040	NO	2.90	9.80	1.30E-05		0.000	0	0.00
T008961_066	NO	1.19	1.59	1.80E-06		0.000	0	0.00
T010330_001	LO	3.98	285.59	8.17E-04		0.513	1	12.95
T010330_009	LO	3.15	225.00	8.64E-02		0.670	1	1.96
T010330_010	HI	5.17	1319.02	8.64E-02		0.898	4	273.14
T010330_011	NO	3.99	237.24	4.32E-02		0.045	1	0.55
T010330_012	NO	4.82	196.54	4.32E-02		0.051	1	0.37
T010330_013	HI	3.33	255.44	2.70E-05	Yes	0.811	1	22.19
T010330_014	NO	3.81	223.52	2.40E-03		0.048	1	0.39
T011957_005	LO	3.02	90.24	2.42E-05		0.354	1	0.47
T012039_012	LO	1.88	4.33	9.01E-04		0.478	1	0.25
T012039_014	NO	2.76	6.57	9.02E-04		0.062	1	0.25
T012153_008	LO	4.49	252.81	2.67E-02		0.601	1	4.75
T012153_009	LO	3.88	53.66	7.08E-03		0.616	1	1.78
T012153_013	LO	2.41	18.05	4.80E-06		0.442	1	0.25
T012278_002	LO	3.36	33.81	4.65E-04		0.546	1	1.33
T012864_001	LO	3.73	152.10	1.55E-03		0.391	1	4.46
T013037_005	LO	1.47	2.06	4.42E-03		0.466	1	0.25
T013037_039	LO	0.69	0.55	8.30E-05		0.553	1	0.25

**Table E-5. Tank-Specific Parameters**

Tank ID Number	Aeration Characteristics	Source Depth (m)	Area of the Source (m <sup>2</sup> )	Volumetric Influent Flow Rate (m <sup>3</sup> /s)	Volumetric Influent Flow Rate Replaced	Fraction Surface Area Turbulent (fraction)	Number of Impellers/Aerators	Total Power of Impellers/Aerators (hp)
T013623_005	LO	1.81	5.01	5.22E-03		0.380	1	0.25
T013748_086	NO	2.33	4.05	3.44E-03		0.000	0	0.00
T016485_010	LO	4.84	1173.43	8.35E-03		0.648	2	39.80
T016485_011	LO	4.50	1260.78	2.03E-02		0.330	1	35.59
T016485_012	LO	5.53	1026.97	2.03E-02		0.380	2	24.25
T016485_013	NO	4.72	1602.74	6.11E-02		0.007	1	1.24
T016485_015	LO	4.33	218.45	4.88E-05		0.586	1	4.59
T016485_016	LO	4.37	216.63	4.88E-05		0.437	1	5.83
T016485_017	LO	3.69	256.68	4.88E-05		0.606	1	8.77
T016576_009	NO	4.96	868.14	1.37E-04	Yes	0.000	0	0.00
T017160_033	LO	3.73	54.78	1.63E-02		0.710	1	0.76
T017160_036	NO	3.38	51.50	1.63E-02		0.079	1	0.25
T017160_040	HI	3.67	8452.59	3.29E-01		0.713	13	1164.90
T017160_041	HI	3.68	8430.73	3.88E-01		0.810	12	890.81
T017160_042	NO	5.61	2771.00	3.62E-01		0.004	1	0.42
T017160_048	NO	4.50	588.60	1.43E-03		0.019	1	0.60
T018408_002	LO	2.41	7.86	7.41E-05		0.403	1	0.25
T018440_002	NO	3.18	116.79	1.36E-02		0.090	1	0.42
T018440_006	LO	4.02	846.78	2.72E-02		0.567	1	9.14
T018440_007	LO	2.97	63.71	2.72E-02		0.361	1	1.07
T019729_005	LO	3.23	128.98	1.89E-02		0.550	1	3.62
T019729_006	LO	4.55	174.58	1.89E-02		0.678	1	5.05
T023978_049	NO	5.77	1969.69	9.16E-01		0.006	1	0.85
T023978_050	NO	5.44	2086.13	9.16E-01		0.002	1	0.25
T023978_051	HI	3.38	3361.45	9.15E-01		0.720	3	263.74
T023978_052	HI	5.54	2049.16	9.15E-01		0.706	4	330.11
T023978_053	HI	4.80	4734.60	9.15E-01		0.849	8.5	829.29
T023978_054	NO	5.23	2170.69	9.16E-01		0.005	1	1.43
T023978_055	NO	3.76	3021.62	9.16E-01		0.004	1	0.72
T024018_020	NO	3.56	228.20	3.59E-05		0.047	1	0.39
T024158_009	NO	4.67	263.46	2.16E-02		0.041	1	0.50
T024158_010	NO	3.95	311.62	1.17E-03		0.035	1	0.49
T024414_003	LO	3.13	656.83	6.26E-03		0.692	1	11.47
T024414_004	LO	4.80	428.33	6.26E-03		0.648	1	7.18
T024414_005	LO	4.71	317.47	6.96E-04		0.420	1	14.35
T024414_006	LO	4.84	309.19	6.96E-04		0.559	1	9.98
T024414_007	NO	4.80	250.08	6.96E-03		0.043	1	0.71
T024414_008	NO	4.64	355.14	6.96E-03		0.031	1	0.86
T025650_013	LO	3.91	301.99	1.45E-03		0.315	1	14.28
T025783_052	LO	1.32	1.15	1.40E-04		0.414	1	0.25
T026013_016	NO	1.23	1.84	5.60E-04		0.084	1	0.25
T026153_010	NO	3.04	44.89	5.01E-03		0.126	1	0.25
T027490_009	LO	3.07	20.99	2.52E-05		0.613	1	0.40
T031054_032	NO	5.07	746.81	3.53E-01		0.000	0	0.00
T031054_033	NO	4.28	883.76	3.53E-01		0.000	0	0.00
T031054_034	NO	5.85	647.04	3.53E-01		0.000	0	0.00
T031054_037	LO	3.79	319.71	6.07E-04		0.794	1	8.52

**Table E-5. Tank-Specific Parameters**

Tank ID Number	Aeration Characteristics	Source Depth (m)	Area of the Source (m <sup>2</sup> )	Volumetric Influent Flow Rate (m <sup>3</sup> /s)	Volumetric Influent Flow Rate Replaced	Fraction Surface Area Turbulent (fraction)	Number of Impellers/Aerators	Total Power of Impellers/Aerators (hp)
T031054_038	LO	4.03	300.53	6.07E-04		0.466	1	11.31
T031054_041	LO	4.31	175.83	4.71E-01		0.404	1	9.99
T031054_042	LO	4.01	188.74	4.71E-01		0.757	1	2.15
T031054_043	LO	4.39	172.55	4.71E-01		0.326	1	2.83
T031054_045	LO	4.31	281.05	6.00E-04		0.354	1	7.70
T031054_046	HI	3.77	4644.58	4.71E-01		0.732	9	555.70
T031054_047	HI	5.06	3455.96	4.71E-01		0.655	7	649.23
T031054_048	HI	3.46	5054.12	4.71E-01		0.585	4	317.71
T031054_049	NO	4.26	2490.82	7.07E-01		0.000	0	0.00
T031054_050	NO	5.91	1792.45	7.07E-01		0.000	0	0.00
T031054_052	NO	4.97	762.09	3.53E-01		0.000	0	0.00
T034595_018	LO	1.50	2.53	6.90E-06		0.524	1	0.25
T034819_078	LO	4.17	454.07	5.40E-02		0.638	1	11.48
T034819_080	NO	4.22	224.31	5.76E-02		0.048	1	0.53
T034819_122	LO	4.33	363.02	1.86E-03		0.200	1	6.07
T035931_008	LO	2.43	46.66	7.20E-03		0.691	1	0.84
T035964_002	LO	2.66	8.54	4.80E-06		0.411	1	0.25
T036111_001	LO	4.45	390.96	1.07E-01		0.717	1	17.35
T036111_002	LO	5.24	303.26	1.07E-01		0.551	1	8.45
T036111_004	LO	2.96	47.40	1.07E-01		0.458	1	1.60
T036111_007	LO	3.42	52.09	1.07E-01		0.449	1	1.67
T036111_008	NO	4.33	174.80	7.15E-02		0.000	0	0.00
T036111_011	NO	3.74	68.02	5.37E-02		0.000	0	0.00
T036111_012	NO	3.12	81.49	5.37E-02		0.000	0	0.00
T036111_013	NO	3.47	70.82	2.19E-02		0.000	0	0.00
T036376_008	LO	3.06	28.48	1.46E-02		0.370	1	0.72
T036376_032	NO	3.17	11.96	1.46E-03		0.100	1	0.25
T036921_005	LO	1.34	1.83	1.09E-03		0.271	1	0.25
T036947_001	LO	5.32	2135.66	4.02E-02		0.744	1	55.16
T036947_002	LO	3.00	63.06	4.02E-02		0.800	1	1.39
T036947_003	NO	3.41	55.57	4.02E-02		0.078	1	0.25
T036954_017	LO	0.80	0.71	2.40E-07		0.518	1	0.25
T036954_018	LO	0.92	0.62	2.40E-07		0.631	1	0.25
T038026_001	LO	2.94	33.53	1.87E-03		0.541	1	0.64
T038620_009	LO	3.80	119.39	7.56E-03		0.385	1	3.60
T040410_003	NO	4.62	171.88	4.46E-03		0.062	1	0.71
T040832_007	LO	2.49	10.65	2.93E-03		0.516	1	0.25
T041491_007	LO	3.09	30.63	9.00E-04		0.424	1	0.53
T041491_009	LO	2.69	35.16	9.00E-04		0.751	1	0.49
T041491_015	NO	3.31	51.53	3.60E-03		0.080	1	0.25
T042135_013	LO	3.82	11.09	1.34E-03		0.553	1	0.25
T043059_001	LO	1.25	2.88	1.08E-03		0.393	1	0.25
T045013_010	LO	3.28	39.28	4.08E-06	Yes	0.584	1	1.39
T045013_011	LO	3.45	37.29	9.26E-04		0.478	1	0.73
T045393_001	LO	4.54	187.68	2.86E-04		0.674	1	6.58
T045393_007	LO	4.10	92.35	2.89E-04		0.297	1	2.24
T045484_051	LO	3.91	116.09	7.20E-05		0.200	1	3.34

**Table E-5. Tank-Specific Parameters**

Tank ID Number	Aeration Characteristics	Source Depth (m)	Area of the Source (m <sup>2</sup> )	Volumetric Influent Flow Rate (m <sup>3</sup> /s)	Volumetric Influent Flow Rate Replaced	Fraction Surface Area Turbulent (fraction)	Number of Impellers/Aerators	Total Power of Impellers/Aerators (hp)
T046441_003	LO	2.55	31.12	4.50E-04		0.537	1	0.54
T049353_003	LO	3.35	15.13	2.80E-02		0.685	1	0.25
T049361_008	HI	2.93	17.95	3.51E-04		0.647	1	1.45
T049478_006	LO	5.91	4305.89	2.36E-03		0.200	2	183.26
T049478_007	HI	3.70	424.73	3.92E-03		0.765	1	32.90
T049478_008	NO	2.92	22.28	3.93E-03		0.110	1	0.25
T051474_009	LO	3.44	21.99	1.14E-04		0.572	1	0.53
T051474_018	NO	1.64	2.66	2.55E-04		0.065	1	0.25
T051474_025	LO	2.68	4.65	2.55E-04		0.675	1	0.25
T051474_027	NO	3.14	6.51	2.03E-05		0.076	1	0.25
T051953_015	LO	2.56	13.32	1.51E-02		0.438	1	0.25
T051953_019	NO	4.16	416.58	1.51E-02		0.026	1	0.25
T051953_020	NO	4.17	415.79	1.51E-02		0.026	1	0.61
T051953_022	NO	2.93	12.77	3.78E-03		0.080	1	0.25
T052241_011	LO	3.54	65.85	1.34E-03		0.498	1	1.34
T052241_014	LO	3.23	41.05	2.49E-03		0.541	1	0.79
T052456_032	LO	1.40	1.49	2.15E-06		0.521	1	0.25
T052787_008	LO	2.19	3.97	4.99E-05		0.416	1	0.25
T052787_012	LO	2.58	197.79	2.68E-02		0.469	1	2.28
T052910_025	LO	1.06	1.24	6.72E-07		0.253	1	0.25
T053090_004	LO	2.27	8.33	2.76E-06		0.492	1	0.25
T053132_080	LO	5.11	666.83	1.08E-04	Yes	0.200	1	21.51
T053769_006	NO	3.12	3.63	1.82E-03		0.082	1	0.25
T054452_004	NO	2.88	78.80	3.60E-05		0.095	1	0.25
T054544_014	NO	3.06	37.08	2.06E-01		0.055	1	0.25
T054544_016	HI	3.39	714.37	2.06E-01		0.745	2	58.86
T054544_017	HI	4.16	582.44	2.06E-01		0.651	1	48.54
T054585_003	NO	4.20	630.83	1.45E-01		0.018	1	0.34
T054585_005	NO	3.15	420.73	1.57E-01		0.026	1	0.68
T054585_006	NO	3.67	361.00	1.57E-01		0.030	1	0.58
T054585_007	NO	4.31	307.28	1.57E-01		0.021	1	0.25
T054585_008	NO	3.55	191.82	9.72E-04		0.028	1	0.25
T054585_009	NO	3.85	177.07	9.72E-04		0.060	1	0.29
T054635_042	NO	4.50	273.53	8.00E-02		0.000	0	0.00
T054635_043	NO	3.20	384.61	8.00E-02		0.000	0	0.00
T054635_044	NO	3.50	362.26	7.57E-03		0.000	0	0.00
T054635_045	NO	3.72	325.27	5.34E-02		0.000	0	0.00
T054635_046	NO	3.57	339.66	5.34E-02		0.032	1	0.25
T054635_047	NO	4.62	261.98	5.34E-02		0.041	1	0.42
T054635_049	LO	2.51	56.19	5.57E-06		0.200	1	1.04
T054726_006	LO	2.12	37.82	5.14E-03		0.598	1	0.69
T054809_003	LO	4.76	357.62	6.15E-03		0.665	1	10.90
T054809_004	LO	1.58	3.59	6.15E-03		0.289	1	0.25
T054841_004	NO	2.25	5.89	2.19E-02		0.049	1	0.25
T056234_005	LO	3.67	42.24	2.79E-03		0.705	1	1.46
T056481_015	NO	4.22	67.24	1.20E-04		0.000	0	0.00
T056481_016	NO	2.92	97.38	1.20E-04		0.000	0	0.00

**Table E-5. Tank-Specific Parameters**

Tank ID Number	Aeration Characteristics	Source Depth (m)	Area of the Source (m <sup>2</sup> )	Volumetric Influent Flow Rate (m <sup>3</sup> /s)	Volumetric Influent Flow Rate Replaced	Fraction Surface Area Turbulent (fraction)	Number of Impellers/Aerators	Total Power of Impellers/Aerators (hp)
T056580_001	LO	2.57	39.60	5.06E-06		0.800	1	0.91
T056580_002	LO	2.60	39.22	5.06E-06		0.524	1	1.17
T056580_004	LO	3.71	27.47	5.06E-06		0.308	1	1.27
T056580_005	LO	2.88	35.34	5.06E-06		0.800	1	1.29
T056663_059	NO	4.33	1310.07	5.57E-03		0.009	1	1.09
T056663_067	NO	4.09	1109.93	2.81E-01		0.010	1	0.45
T056663_068	NO	5.14	884.50	2.81E-01		0.013	1	0.65
T056663_069	NO	5.46	832.01	2.81E-01		0.014	1	0.92
T056952_001	LO	2.34	5.43	2.49E-01		0.304	1	0.25
T057430_020	NO	2.92	16.39	6.68E-04		0.058	1	0.25
T057430_025	NO	1.81	1.89	9.03E-04		0.070	1	0.25
T057430_026	NO	3.38	49.29	9.03E-04		0.069	1	0.25

Source: U.S. EPA (Environmental Protection Agency). 1987. *1986 National Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities (TSDR) Database*. Office of Solid Waste, Washington, DC.

Note: See Appendix L for detailed information regarding the derivation of the above parameters.



## **Appendix F**

### **Variable Summary of Aboveground Fate and Transport Model**

Table F-1 Variable Summary of Aboveground Fate and Transport Model



*Appendix F***Table F-1. Variable Summary of Aboveground Fate and Transport Model**

<b>Code</b>	<b>Parameter Name</b>	<b>Units</b>	<b>Type</b>	<b>Value</b>	<b>Comments</b>	<b>Reference</b>
<b>Food Chain</b>						
Bs	Bioavailability fraction of contaminant in soil	Unitless	Constant	1	Set to a default value of 1	U.S. EPA, 1997
DWr	Dry weight fraction for root vegetables	Unitless	Constant	0.13		U.S. EPA, 1997
Ffbs	Fraction of forage grown in contaminated soil - subsistence beef cattle	Unitless	Constant	1		U.S. EPA, 1997
Ffds	Fraction of forage grown in contaminated soil - subsistence dairy cattle	Unitless	Constant	1		U.S. EPA, 1997
Fgbs	Faction of grain grown in contaminated soil - subsistence beef cattle	Unitless	Constant	1		U.S. EPA, 1997
Fgds	Fraction of grain grown in contaminated soil - subsistence dairy cattle	Unitless	Constant	1		U.S. EPA, 1997
Fsbs	Fraction of silage grown in contaminated soil - subsistence beef cattle	Unitless	Constant	1		U.S. EPA, 1997
Fsds	Fraction of silage grown in contaminated soil - subsistence dairy cattle	Unitless	Constant	1		U.S. EPA, 1997
MAF_exfruit	Moisture adjustment factor (converts DW into WW)	%	Constant	85		U.S. EPA, 1997
MAF_exveg	Moisture adjustment factor (converts DW into WW)	%	Constant	92		U.S. EPA, 1997
MAF_profruit	Moisture adjustment factor (converts DW into WW)	%	Constant	90		U.S. EPA, 1997
Qfbs	Consumption rate of forage by subsistence beef cattle	kg DW/d	Constant	8.8		U.S. EPA, 1997
Qfds	Consumption rate of forage by subsistence dairy cattle	kg DW/d	Constant	11		U.S. EPA, 1997
Qgbs	Consumption rate of grain by subsistence beef cattle	kg DW/d	Constant	0.47		U.S. EPA, 1997
Qgds	Consumption rate of grain by subsistence dairy cattle	kg DW/d	Constant	2.6		U.S. EPA, 1997
Qsbs	Consumption rate of silage by subsistence beef cattle	kg DW/d	Constant	2.5		U.S. EPA, 1997
Qsds	Consumption rate of silage by subsistence dairy cattle	kg DW/d	Constant	3.3		U.S. EPA, 1997
Qsoilbs	Consumption rate of soil by subsistence beef cattle	kg/d	Constant	0.39		U.S. EPA, 1997

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<b>Code</b>	<b>Parameter Name</b>	<b>Units</b>	<b>Type</b>	<b>Value</b>	<b>Comments</b>	<b>Reference</b>
Qsoilds	Consumption rate of soil by subsistence dairy cattle	kg/d	Constant	0.41		U.S. EPA, 1997
Qwbs	Consumption rate of water by subsistence beef cattle	L/d	Constant	87		U.S. EPA, 1997
Qwds	Consumption rate of water by subsistence dairy cattle	L/d	Constant	91.6		U.S. EPA, 1997
Rp_exfruit	Interception fraction - exposed fruit	Unitless	Constant	0.052		U.S. EPA, 1997
Rp_exveg	Interception fraction - aboveground vegetables	Unitless	Constant	0.05		U.S. EPA, 1997
Rp_forage	Interception fraction - forage	Unitless	Constant	0.47		U.S. EPA, 1997
Rp_silage	Interception fraction - silage	Unitless	Constant	0.44		U.S. EPA, 1997
Tp_exfruit	Length of plant exposure to deposition - exposed fruit	yr	Constant	0.123		U.S. EPA, 1997
Tp_exveg	Length of plant exposure to deposition - aboveground vegetables	yr	Constant	0.123		U.S. EPA, 1997
Tp_forage	Length of plant exposure to deposition - forage	yr	Constant	0.12		U.S. EPA, 1997
Tp_silage	Length of plant exposure to deposition - silage	yr	Constant	0.16		U.S. EPA, 1997
VGag_exfruit	Empirical correction factor for exposed fruit	Unitless	Constant	0.01		U.S. EPA, 1997
VGag_exveg	Empirical correction factor for aboveground vegetables	Unitless	Constant	0.01		U.S. EPA, 1997
VGag_forage	Empirical correction factor for forage	Unitless	Constant	1		U.S. EPA, 1997
VGag_silage	Empirical correction factor for silage	Unitless	Constant	0.5		U.S. EPA, 1997
VGbg	Empirical correction factor for belowground vegetables	Unitless	Constant	0.01		U.S. EPA, 1997
Yp_exfruit	Crop yield - aboveground vegetables	kg DW/m <sup>2</sup>	Constant	0.09		U.S. EPA, 1997
Yp_exveg	Crop yield - aboveground vegetables	kg DW/m <sup>2</sup>	Constant	0.18		U.S. EPA, 1997
Yp_forage	Crop yield - forage	kg DW/m <sup>2</sup>	Constant	0.31		U.S. EPA, 1997
Yp_silage	Crop yield - silage	kg DW/m <sup>2</sup>	Constant	0.31		U.S. EPA, 1997
<b>Site Data</b>						
Af	Area of agricultural field	m <sup>2</sup>	Constant	Site-specific	See Appendix I	
Q	Average annual recharge	cm/yr	Constant	Site-specific	See Appendix I	
R	USLE rainfall/erosivity factor	1/yr	Constant	Site-specific	See Appendix I	

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<b>Code</b>	<b>Parameter Name</b>	<b>Units</b>	<b>Type</b>	<b>Value</b>	<b>Comments</b>	<b>Reference</b>
Rf	Average annual runoff	cm/yr	Constant	Site-specific		See Appendix I
uw	Mean annual windspeed	m/s	Constant	Site-specific		See Appendix I
<b>Surface Soil</b>						
BD_top20	Dry bulk soil density; top 20 cm of soil	g/cm3	Constant	Site-specific		See Appendix I
C	USLE cover management factor	Unitless	Constant	0.1	Reflects an average of various land covers	Based on U.S. EPA, 1997
ER	Soil enrichment ratio	Unitless	Constant	3		U.S. EPA, 1997
foc_top20	Fraction organic carbon; top 20 cm of soil	Unitless	Constant	Site-specific		See Appendix I
K_top20	USLE erodibility factor; top 20 cm of soil	ton/acre	Constant	Site-specific		See Appendix I
Ksat_top20	Saturated hydraulic conductivity; top 20 cm of soil	cm/yr	Constant	Site-specific		See Appendix I
LS	USLE length-slope factor (calculated)	Unitless	Constant	Site-specific		See Appendix I
P	USLE supporting practice factor	Unitless	Constant	1	Assumes no supporting practice	U.S. EPA, 1997
Psoil	Particle density (quartz)	g/cm3	Constant	2.65		
SMb_top20	Soil moisture coefficient b; top 20 cm of soil	Unitless	Constant	Site-specific		See Appendix I
WCS_top20	Saturated water content (total porosity); top 20 cm of soil (can be calculated from bulk density)	mL/cm3 or L/L	Constant	Site-specific		See Appendix I
Zt	Mixing depth of soil at receptor - tilled	cm	Constant	20		U.S. EPA, 1997
Zu	Mixing depth of soil at receptor - untilled	cm	Constant	1		U.S. EPA, 1997
<b>Waterbody</b>						
bsc	Bed sediments concentration	kg/L	Constant	1		U.S. EPA, 1998
bsp	Bed sediment porosity	cm3/cm3	Constant	0.6		U.S. EPA, 1998
db	Depth of upper benthic layer	m	Constant	0.03		U.S. EPA, 1998
dw	Depth of water column	m	Calculated	0.18	Calculated by subtracting the water column depth from the total waterbody depth.	U.S. EPA, 1998
dz	Waterbody depth	m	Constant	0.21		van der Leeden et al., 1990
foc_bs	Fraction organic carbon for bed sediments	Unitless	Constant	0.04		U.S. EPA, 1998
foc_sw	Fraction organic carbon for suspended sediments	Unitless	Constant	0.075		U.S. EPA, 1998

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<b>Code</b>	<b>Parameter Name</b>	<b>Units</b>	<b>Type</b>	<b>Value</b>	<b>Comments</b>	<b>Reference</b>
Kg	Gas phase transfer coefficient	m/yr	Constant	36500	Constant value for a flowing system	U.S. EPA, 1998
T	Waterbody temperature	K	Constant	298		U.S. EPA, 1998
TSS	Total suspended solids in water column	mg/L	Constant	10		U.S. EPA, 1998
U	Velocity of the stream	m/s	Constant	0.5		U.S. EPA, 1998
V	Flow independent mixing volume	m <sup>3</sup>	Calculated	Waw x (dw + db)		U.S. EPA, 1998
Vfx	Waterbody flow mixing volume	m <sup>3</sup> /yr	Constant	13000000	Flow was determined for a 3rd-order stream.	van der Leeden et al., 1990
Wai	Impervious watershed area	m <sup>2</sup>	Constant	0		U.S. EPA, 1998
Wat	Total area of watershed	m <sup>2</sup>	Calculated	run-specific	Based on the size of the agricultural field	See Chapter 4
Waw	Area of waterbody	m <sup>2</sup>	Calculated	Site-specific		See Appendix I
<b>WMU Data</b>						
T1	Time exposure begins	yr	Constant	0		
Td	Time period of deposition	yr	Constant	Landfills = 30; Tanks & SI = 50	Based on the assumed operating time of a WMU	

## References:

U.S. EPA (Environmental Protection Agency). 1997. The Parameter Guidance Document. A Companion Document to the Methodology for Assessing Health Risks Associated with Multiple Pathways Exposure to Combustor Emissions (Internal Draft). NCEA-0238. National Center for Environmental Assessment, Cincinnati, OH. March.

U.S. EPA (Environmental Protection Agency). 1998. Methodology for Assessing Health Risks Associated with Multiple Pathways of Exposure to Combustor Emissions. Update to EPA/600/6-90/003 Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions. EPA 600/R-98/137. National Center for Environmental Assessment, Cincinnati, OH.

van der Leeden, F., F.L. Troise, and D.K. Todd. 1990. The Water Encyclopedia. 2nd edition. Chelsea, Michigan: Lewis Publishers, p. 176.